Site Assessment Report and Corrective Action Plan for the Risk-Based Closure of the Former Military Gas Station (Facility 462)

Volume 2 of 2 (Appendices)



Eaker Air Force Base
Arkansas

Prepared For

Air Force Center for Environmental Excellence
Technology Transfer Division
Brooks Air Force Base, Texas

and

Air Force Base Conversion Agency
Eaker Air Force Base
Arkansas

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DISTRIBUTION STATEMENT A
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Walton, Norman

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Sent: Tuesday, August 08, 2000 10:16 AM

To: 'nwalton@dtic.mil'

Subject: Distribution statement for AFCEE/ERT reports

Norman, This is a followup to our phone call. The eight boxes of reports you received from us are all for unlimited distribution. If you have any questions, you can contact me at DSN 240-4353.

APPENDIX A

ANALYTICAL DATA SHEETS AND CHAIN-OF-CUSTODY RECORDS

PHASE I ANALYTICAL RESULTS

Quanterra Incorporated
4955 Yarrow Street
Arvada, Colorado 80002

303 421-6611 Telephone
303 431-7171 Fax

ANALYTICAL REPORT

Eaker AFB

Lot #: D8K200146

Doug Downey

Parsons Engineering Services

QUANTERRA INCORPORATED

Ellen La Riviere
Project Manager

December 23, 1998

Project Narrative

(D8K200146)

With the exceptions noted on the data sheets, standard analytical protocols were followed in the analyses of the samples. All laboratory quality control samples analyzed in conjunction with the samples in this project were within established control limits.

GC Volatile BTEX

The Method 8020 surrogates were diluted out of sample –010 and -016, the samples were diluted due to elevated concentrations of target and/or non-target compounds. Likewise. the spike and surrogate compounds added to the MS/MSD aliquot performed on sample –010, were diluted out.

GC Volatile GRO

The Method 8015 GRO surrogates were diluted out of sample –010 and -016, the samples were diluted due to elevated concentrations of target compounds. Likewise, the spike and surrogate compounds added to the MS/MSD aliquot performed on sample –010, were diluted out.

GC Semi-Volatile DRO

The Method 8015-DRO surrogates were diluted to less than detectable concentrations in samples D8K200146-006, and –007 due to elevated concentrations of target compounds.

The matrix spike and surrogate compounds were not recoverable from the MS/MSD performed on sample –010. The laboratory attributes the anomaly to matrix effect.

EXECUTIVE SUMMARY - Detection Highlights

D8K200146

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
P-1 11/18/98 14:50 001				
Diesel Range Organics	15	4.6	mg/kg	SW846 8015 MOD
Gasoline Range Organics	1.3 B	1.2	mg/kg	SW846 8015 MOD
Percent Moisture	13.4	0.10	%	MCAWW 160.3 MOD
P-2 11/18/98 15:05 002				
Diesel Range Organics	8.0	4.6	mg/kg	SW846 8015 MOD
Toluene	0.00055 F	0.0023	mg/kg	SW846 8020A
Toluene	0.00072 F	0.0023	mg/kg	SW846 8020A
Toluene	0.00072 F	0.0023	mg/kg	SW846 8020A
Gasoline Range Organics	0.75 F,B	1.2	mg/kg	SW846 8015 MOD
Percent Moisture	13.6	0.10	%	MCAWW 160.3 MOD
P-3 11/18/98 15:30 003				
Diesel Range Organics	13	4.5	mg/kg	SW846 8015 MOD
Gasoline Range Organics	0.46 F,B	1.1	mg/kg	SW846 8015 MOD
Percent Moisture	10.7	0.10	%	MCAWW 160.3 MOD
P-4 11/18/98 15:45 004				
Diesel Range Organics	20	4.6	mg/kg	SW846 8015 MOD
Toluene	0.0013 F	0.0023	mg/kg	SW846 8020A
Toluene	0.0012 F	0.0023	mg/kg	SW846 8020A
Toluene	0.0012 F	0.0023	mg/kg	SW846 8020A
Gasoline Range Organics	0.37 F,B	1.2	mg/kg	SW846 8015 MOD
Percent Moisture	13.7	0.10	%	MCAWW 160.3 MOD
P-5 11/18/98 15:55 005				
Diesel Range Organics	24	4.4	mg/kg	SW846 8015 MOD
Gasoline Range Organics	0.30 F,B	1.1	mg/kg	SW846 8015 MOD
Percent Moisture	10	0.10	%	MCAWW 160.3 MOD
P-6 11/18/98 16:10 006				
Diesel Range Organics	390	46	mg/kg	SW846 8015 MOD
Benzene	0.094	0.0012	mg/kg	SW846 8020A
Benzene	0.083	0.0012	mg/kg	SW846 8020A
Benzene	0.083	0.0012	mg/kg	SW846 8020A
Ethylbenzene	0.15	0.0023	mg/kg	SW846 8020A
Ethylbenzene	0.14	0.0023	mg/kg	SW846 8020A
Ethylbenzene	0.14	0.0023	mg/kg	SW846 8020A

(Continued on next page)

EXECUTIVE SUMMARY - Detection Highlights

D8K200146

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
P-6 11/18/98 16:10 006				
Toluene	0.078	0.0023	mg/kg	SW846 8020A
Toluene	0.060	0.0023	mg/kg	SW846 8020A
Toluene	0.060	0.0023	mg/kg	SW846 8020A
Xylenes (total)	0.34	0.0023	mg/kg	SW846 8020A
Xylenes (total)	0.29	0.0023	mg/kg	SW846 8020A
Xylenes (total)	0.29	0.0023	mg/kg	SW846 8020A
Gasoline Range Organics	5.4 B	1.2	mg/kg	SW846 8015 MOD
Percent Moisture	13.1	0.10	%	MCAWW 160.3 MOD
P-7 11/18/98 16:30 007				
Diesel Range Organics	480	46	mg/kg	SW846 8015 MOD
Benzene	0.083	0.0012	mg/kg	SW846 8020A
Benzene	0.079	0.0012	mg/kg	SW846 8020A
Benzene	0.079	0.0012	mg/kg	SW846 8020A
Ethylbenzene	0.12	0.0023	mg/kg	SW846 8020A
Ethylbenzene	0.12	0.0023	mg/kg	SW846 8020A
Ethylbenzene	0.12	0.0023	mg/kg	SW846 8020A
Toluene	0.053	0.0023	mg/kg	SW846 8020A
Toluene	0.043	0.0023	mg/kg	SW846 8020A
Toluene	0.043	0.0023	mg/kg	SW846 8020A
Xylenes (total)	0.29	0.0023	mg/kg	SW846 8020A
Xylenes (total)	0.27	0.0023	mg/kg	SW846 8020A
Xylenes (total)	0.27	0.0023	mg/kg	SW846 8020A
Gasoline Range Organics	7.5 B	1.2	mg/kg	SW846 8015 MOD
Percent Moisture	13.2	0.10	%	MCAWW 160.3 MOD
P-9 11/18/98 17:00 008				
Diesel Range Organics	15	4.7	mg/kg	SW846 8015 MOD
Benzene	0.0020	0.0012	mg/kg	SW846 8020A
Benzene	0.0025	0.0012	mg/kg	SW846 8020A
Benzene	0.0025	0.0012	mg/kg	SW846 8020A
1,2-Dichlorobenzene	0.0026 F	0.0047	mg/kg	SW846 8020A
1,2-Dichlorobenzene	0.0026 F	0.0047	mg/kg	SW846 8020A
1,4-Dichlorobenzene	0.0012 F	0.0036	mg/kg	SW846 8020A
1,4-Dichlorobenzene	0.0012 F	0.0036	mg/kg	SW846 8020A
Ethylbenzene	0.00095 F	0.0024	mg/kg	SW846 8020A
Ethylbenzene	0.0014 F	0.0024	mg/kg	SW846 8020A
Ethylbenzene	0.0014 F	0.0024	mg/kg	SW846 8020A
Toluene	0.0030	0.0024	mg/kg	SW846 8020A
Toluene	0.0011 F	0.0024	mg/kg	SW846 8020A
Toluene	0.0011 F	0.0024	mg/kg	SW846 8020A

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EXECUTIVE SUMMARY - Detection Highlights

D8K200146

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
P-9 11/18/98 17:00 008				
Xylenes (total)	0.0042	0.0024	mg/kg	SW846 8020A
Xylenes (total)	0.0037	0.0024	mg/kg	SW846 8020A
Xylenes (total)	0.0037	0.0024	mg/kg	SW846 8020A
Gasoline Range Organics	0.94 F,B	1.2	mg/kg	SW846 8015 MOD
Percent Moisture	15.6	0.10	%	MCAWW 160.3 MOD
P-8 11/18/98 16:45 009				
Diesel Range Organics	18	4.8	mg/kg	SW846 8015 MOD
Benzene	0.73	0.0012	mg/kg	SW846 8020A
Benzene	0.68	0.0012	mg/kg	SW846 8020A
Benzene	0.68	0.0012	mg/kg	SW846 8020A
Ethylbenzene	0.47	0.0024	mg/kg	SW846 8020A
Ethylbenzene	0.44	0.0024	mg/kg	SW846 8020A
Ethylbenzene	0.44	0.0024	mg/kg	SW846 8020A
Toluene	2.2	0.0024	mg/kg	SW846 8020A
Toluene	2.0	0.0024	mg/kg	SW846 8020A
Toluene	2.0	0.0024	mg/kg	SW846 8020A
Xylenes (total)	2.8	0.0024	mg/kg	SW846 8020A
Xylenes (total)	2.5	0.0024	mg/kg	SW846 8020A
Xylenes (total)	2.5	0.0024	mg/kg	SW846 8020A
Gasoline Range Organics	43 B	1.2	mg/kg	SW846 8015 MOD
Anthracene	0.0031 F	0.53	mg/kg	SW846 8310
Anthracene	0.0031 F	0.53	mg/kg	SW846 8310
Anthracene	0.0043 F	0.53	mg/kg	SW846 8310
Benzo(b)fluoranthene	0.0034 F	0.014	mg/kg	SW846 8310
Benzo(b)fluoranthene	0.0034 F	0.014	mg/kg	SW846 8310
Benzo(b)fluoranthene	0.0091 F	0.014	mg/kg	SW846 8310
Naphthalene	2.2	1.4	mg/kg	SW846 8310
Naphthalene	2.2	1.4	mg/kg	SW846 8310
Naphthalene	2.2	1.4	mg/kg	SW846 8310
Phenanthrene	0.033 F	0.51	mg/kg	SW846 8310
Phenanthrene	0.039 F	0.51	mg/kg	SW846 8310
Phenanthrene	0.039 F	0.51	mg/kg	SW846 8310
Percent Moisture	17.0	0.10	%	MCAWW 160.3 MOD
P-10 11/19/98 07:25 010				
Diesel Range Organics	51	4.9	mg/kg	SW846 8015 MOD
Benzene	0.20	0.0061	mg/kg	SW846 8020A
Benzene	0.17	0.0061	mg/kg	SW846 8020A
Benzene	0.17	0.0061	mg/kg	SW846 8020A
Ethylbenzene	2.6	0.012	mg/kg	SW846 8020A

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EXECUTIVE SUMMARY - Detection Highlights

D8K200146

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
P-10 11/19/98 07:25 010				
Ethylbenzene	2.5	0.012	mg/kg	SW846 8020A
Ethylbenzene	2.5	0.012	mg/kg	SW846 8020A
Toluene	1.7	0.012	mg/kg	SW846 8020A
Toluene	1.4	0.012	mg/kg	SW846 8020A
Toluene	1.4	0.012	mg/kg	SW846 8020A
Xylenes (total)	13	0.012	mg/kg	SW846 8020A
Xylenes (total)	12	0.012	mg/kg	SW846 8020A
Xylenes (total)	12	0.012	mg/kg	SW846 8020A
Gasoline Range Organics	150 B	6.1	mg/kg	SW846 8015 MOD
Percent Moisture	17.9	0.10	%	MCAWW 160.3 MOD
P-11 11/19/98 08:20 011				
Diesel Range Organics	95	4.6	mg/kg	SW846 8015 MOD
Benzene	0.026	0.0012	mg/kg	SW846 8020A
Benzene	0.034	0.0012	mg/kg	SW846 8020A
Benzene	0.034	0.0012	mg/kg	SW846 8020A
Ethylbenzene	0.24	0.0023	mg/kg	SW846 8020A
Ethylbenzene	0.28	0.0023	mg/kg	SW846 8020A
Ethylbenzene	0.28	0.0023	mg/kg	SW846 8020A
Toluene	0.087	0.0023	mg/kg	SW846 8020A
Toluene	0.041	0.0023	mg/kg	SW846 8020A
Toluene	0.041	0.0023	mg/kg	SW846 8020A
Xylenes (total)	0.99	0.0023	mg/kg	SW846 8020A
Xylenes (total)	0.85	0.0023	mg/kg	SW846 8020A
Xylenes (total)	0.85	0.0023	mg/kg	SW846 8020A
Gasoline Range Organics	15 B	1.2	mg/kg	SW846 8015 MOD
Percent Moisture	13.6	0.10	%	MCAWW 160.3 MOD
P-12 11/19/98 08:30 012				
Diesel Range Organics	41	4.5	mg/kg	SW846 8015 MOD
Benzene	0.10	0.0011	mg/kg	SW846 8020A
Benzene	0.097	0.0011	mg/kg	SW846 8020A
Benzene	0.097	0.0011	mg/kg	SW846 8020A
Ethylbenzene	0.12	0.0022	mg/kg	SW846 8020A
Ethylbenzene	0.10	0.0022	mg/kg	SW846 8020A
Ethylbenzene	0.10	0.0022	mg/kg	SW846 8020A
Toluene	0.31	0.0022	mg/kg	SW846 8020A
Toluene	0.28	0.0022	mg/kg	SW846 8020A
Toluene	0.28	0.0022	mg/kg	SW846 8020A
Xylenes (total)	0.64	0.0022	mg/kg	SW846 8020A
Xylenes (total)	0.56	0.0022	mg/kg	SW846 8020A

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EXECUTIVE SUMMARY - Detection Highlights

D8K200146

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
P-12 11/19/98 08:30 012				
Xylenes (total)	0.56	0.0022	mg/kg	SW846 8020A
Gasoline Range Organics	8.3 B	1.1	mg/kg	SW846 8015 MOD
Percent Moisture	10.2	0.10	%	MCAWW 160.3 MOD
UT-4 11/19/98 09:10 013				
Benzene	0.0069	0.0013	mg/kg	SW846 8020A
Benzene	0.0081	0.0013	mg/kg	SW846 8020A
Benzene	0.0081	0.0013	mg/kg	SW846 8020A
Ethylbenzene	0.0013 F	0.0025	mg/kg	SW846 8020A
Ethylbenzene	0.0013 F	0.0025	mg/kg	SW846 8020A
Ethylbenzene	0.0013 F	0.0025	mg/kg	SW846 8020A
Toluene	0.00061 F	0.0025	mg/kg	SW846 8020A
Toluene	0.00065 F	0.0025	mg/kg	SW846 8020A
Toluene	0.00065 F	0.0025	mg/kg	SW846 8020A
Xylenes (total)	0.0041	0.0025	mg/kg	SW846 8020A
Xylenes (total)	0.0038	0.0025	mg/kg	SW846 8020A
Xylenes (total)	0.0038	0.0025	mg/kg	SW846 8020A
Gasoline Range Organics	1.4 B	1.3	mg/kg	SW846 8015 MOD
Percent Moisture	20.9	0.10	%	MCAWW 160.3 MOD
UT-3 11/19/98 09:30 014				
Diesel Range Organics	5.1	5.0	mg/kg	SW846 8015 MOD
Gasoline Range Organics	0.22 F,B	1.2	mg/kg	SW846 8015 MOD
Percent Moisture	19.8	0.10	%	MCAWW 160.3 MOD
UT-2 11/19/98 11:10 015				
Diesel Range Organics	49	4.5	mg/kg	SW846 8015 MOD
Toluene	0.00080 F	0.0023	mg/kg	SW846 8020A
Toluene	0.00080 F	0.0023	mg/kg	SW846 8020A
Toluene	0.014	0.0023	mg/kg	SW846 8020A
Gasoline Range Organics	1.1 F,B	1.1	mg/kg	SW846 8015 MOD
Percent Moisture	11.8	0.10	%	MCAWW 160.3 MOD
UT-1 11/19/98 12:05 016				
Diesel Range Organics	52	4.2	mg/kg	SW846 8015 MOD
Gasoline Range Organics	160 B	5.3	mg/kg	SW846 8015 MOD
Percent Moisture	4.8	0.10	%	MCAWW 160.3 MOD

ANALYTICAL METHODS SUMMARY

D8K200146

PARAMETER	ANALYTICAL METHOD
Aromatic Volatile Organics by GC	SW846 8020A
Extractable Petroleum Hydrocarbons	SW846 8015 MOD
Percent Moisture	MCAWW 160.3 MOD
Polynuclear Aromatic Hydrocarbons by HPLC	SW846 8310
Volatile Petroleum Hydrocarbons	SW846 8015 MOD

References:

MCAWW "Methods for Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983 and subsequent revisions.

SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

METHOD / ANALYST SUMMARY

D8K200146

ANALYTICAL METHOD	ANALYST	ANALYST ID
MCAWW 160.3 MOD	Andrea Sporleder	001971
MCAWW 160.3 MOD	Duane Allee	001470
SW846 8015 MOD	Don Vieaux	003292
SW846 8015 MOD	Shawn Hadley	060376
SW846 8020A	Shawn Hadley	060376
SW846 8310	Dane Rodgers	007407

References:

MCAWW "Methods for Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983 and subsequent revisions.

SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

SAMPLE SUMMARY

D8K200146

WO #	SAMPLE#	CLIENT SAMPLE ID	DATE	TIME
CNMA3	001	P-1	11/18/98	14:50
CNMCN	002	P-2	11/18/98	15:05
CNMCP	003	P-3	11/18/98	15:30
CNMCW	004	P-4	11/18/98	15:45
CNMCX	005	P-5	11/18/98	15:55
CNMD0	006	P-6	11/18/98	16:10
CNMD1	007	P-7	11/18/98	16:30
CNMD2	008	P-9	11/18/98	17:00
CNMD3	009	P-8	11/18/98	16:45
CNMD6	010	P-10	11/19/98	07:25
CNMD7	011	P-11	11/19/98	08:20
CNMD9	012	P-12	11/19/98	08:30
CNMDA	013	UT-4	11/19/98	09:10
CNMDF	014	UT-3	11/19/98	09:30
CNMDG	015	UT-2	11/19/98	11:10
CNMDK	016	UT-1	11/19/98	12:05

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

PARSONS Engineering Science, INC.

Client Sample ID: P-8

HPLC

Lot-Sample #...:	D8K200146-009	Work Order #...:	CNMD3105	Matrix.....: SO
Date Sampled...:	11/18/98 16:45	Date Received..:	11/20/98	
Prep Date.....:	11/23/98	Analysis Date..:	12/01/98	
Prep Batch #...:	8327214	Analysis Time..:	08:59	
Dilution Factor:	1			
% Moisture.....:	17	Method.....:	SW846 8310	

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Acenaphthene	ND	1.4	mg/kg
Acenaphthylene	ND	1.9	mg/kg
Anthracene	**0.0031 F**	**0.53**	**mg/kg**
Benzo(a)anthracene	ND	0.011	mg/kg
Benzo(b)fluoranthene	**0.0034 F**	**0.014**	**mg/kg**
Benzo(k)fluoranthene	ND	0.013	mg/kg
Benzo(ghi)perylene	ND	0.060	mg/kg
Benzo(a)pyrene	ND	0.018	mg/kg
Chrysene	ND	0.12	mg/kg
Fluoranthene	ND	0.17	mg/kg
Fluorene	ND	0.17	mg/kg
Indeno(1,2,3-cd)pyrene	ND	0.036	mg/kg
Naphthalene	**2.2**	**1.4**	**mg/kg**
Phenanthrene	**0.039 F**	**0.51**	**mg/kg**
Pyrene	ND	0.22	mg/kg
Dibenzo(a,h)anthracene	ND	0.024	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Terphenyl-d14	89	(22 - 167)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

F The analyte was identified but the value was below the RL and above the MDL.

IC

PARSONS Engineering Science, INC.

Client Sample ID: P-8

HPLC

Lot-Sample #...:	D8K200146-009	**Work Order #...:**	CNMD3108	**Matrix.....:**	SO
Date Sampled...:	11/18/98 16:45	**Date Received..:**	11/20/98		
Prep Date.....:	11/23/98	**Analysis Date..:**	12/01/98		
Prep Batch #...:	8327214	**Analysis Time..:**	08:59		
Dilution Factor:	1				
% Moisture.....:	17	**Method.....:**	SW846 8310		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Acenaphthene	ND	1.4	mg/kg
Acenaphthylene	ND	1.9	mg/kg
Anthracene	**0.0043 F**	**0.53**	**mg/kg**
Benzo(a)anthracene	ND	0.011	mg/kg
Benzo(b)fluoranthene	**0.0091 F**	**0.014**	**mg/kg**
Benzo(k)fluoranthene	ND	0.013	mg/kg
Benzo(ghi)perylene	ND	0.060	mg/kg
Benzo(a)pyrene	ND	0.018	mg/kg
Chrysene	ND	0.12	mg/kg
Fluoranthene	ND	0.17	mg/kg
Fluorene	ND	0.17	mg/kg
Indeno(1,2,3-cd)pyrene	ND	0.036	mg/kg
Naphthalene	**2.2**	**1.4**	**mg/kg**
Phenanthrene	**0.033 F**	**0.51**	**mg/kg**
Pyrene	ND	0.22	mg/kg
Dibenzo(a,h)anthracene	ND	0.024	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Terphenyl-d14	86	(22 - 167)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

F The analyte was identified but the value was below the RL and above the MDL.

2C

PARSONS Engineering Science, INC.

Client Sample ID: P-1

GC Volatiles

Lot-Sample #...: D8K200146-001 Work Order #...: CNMA3105 Matrix.....: SO
Date Sampled...: 11/18/98 14:50 Date Received..: 11/20/98
Prep Date.....: 11/23/98 Analysis Date..: 11/23/98
Prep Batch #...: 8329140 Analysis Time..: 12:30
Dilution Factor: 1
% Moisture.....: 13 Method.....: SW846 8020A

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	ND	0.0012	mg/kg
Chlorobenzene	ND	0.0023	mg/kg
1,2-Dichlorobenzene	ND	0.0046	mg/kg
1,3-Dichlorobenzene	ND	0.0046	mg/kg
1,4-Dichlorobenzene	ND	0.0035	mg/kg
Ethylbenzene	ND	0.0023	mg/kg
Toluene	ND	0.0023	mg/kg
Xylenes (total)	ND	0.0023	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	98	(34 - 175)
Fluorobenzene	94	(34 - 175)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

PARSONS Engineering Science, INC.

Client Sample ID: P-2

GC Volatiles

Lot-Sample #...:	D8K200146-002	Work Order #...:	CNMCN105	Matrix.....:	SO
Date Sampled...:	11/18/98 15:05	Date Received..:	11/20/98		
Prep Date.....:	11/23/98	Analysis Date..:	11/23/98		
Prep Batch #...:	8329140	Analysis Time..:	14:18		
Dilution Factor:	1				
% Moisture.....:	14	Method.....:	SW846 8020A		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	ND	0.0012	mg/kg
Chlorobenzene	ND	0.0023	mg/kg
1,2-Dichlorobenzene	ND	0.0046	mg/kg
1,3-Dichlorobenzene	ND	0.0046	mg/kg
1,4-Dichlorobenzene	ND	0.0035	mg/kg
Ethylbenzene	ND	0.0023	mg/kg
Toluene	**0.00072 F**	**0.0023**	**mg/kg**
Xylenes (total)	ND	0.0023	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	98	(34 - 175)
Fluorobenzene	95	(34 - 175)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

F The analyte was identified but the value was below the RL and above the MDL.

1C

PARSONS Engineering Science, INC.

Client Sample ID: P-2

GC Volatiles

Lot-Sample #...:	D8K200146-002	Work Order #...:	CNMCN106	Matrix.....:	SO
Date Sampled...:	11/18/98 15:05	Date Received..:	11/20/98		
Prep Date.....:	11/23/98	Analysis Date..:	11/23/98		
Prep Batch #...:	8329140	Analysis Time..:	14:18		
Dilution Factor:	1				
% Moisture.....:	14	Method.....:	SW846 8020A		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	ND	0.0012	mg/kg
Chlorobenzene	ND	0.0023	mg/kg
1,2-Dichlorobenzene	ND	0.0046	mg/kg
1,3-Dichlorobenzene	ND	0.0046	mg/kg
1,4-Dichlorobenzene	ND	0.0035	mg/kg
Ethylbenzene	ND	0.0023	mg/kg
Toluene	**0.00055 F**	**0.0023**	**mg/kg**
Xylenes (total)	ND	0.0023	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	102	(34 - 175)
Fluorobenzene	99	(34 - 175)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

F The analyte was identified but the value was below the RL and above the MDL.

2C

PARSONS Engineering Science, INC.

Client Sample ID: P-3

GC Volatiles

Lot-Sample #...:	D8K200146-003	Work Order #...:	CNMCP105	Matrix.....:	SO
Date Sampled...:	11/18/98 15:30	Date Received..:	11/20/98		
Prep Date.....:	11/23/98	Analysis Date..:	11/23/98		
Prep Batch #...:	8329140	Analysis Time..:	14:53		
Dilution Factor:	1				
% Moisture.....:	11	Method.....:	SW846 8020A		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	ND	0.0011	mg/kg
Chlorobenzene	ND	0.0022	mg/kg
1,2-Dichlorobenzene	ND	0.0045	mg/kg
1,3-Dichlorobenzene	ND	0.0045	mg/kg
1,4-Dichlorobenzene	ND	0.0034	mg/kg
Ethylbenzene	ND	0.0022	mg/kg
Toluene	ND	0.0022	mg/kg
Xylenes (total)	ND	0.0022	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	101	(34 - 175)
Fluorobenzene	102	(34 - 175)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

PARSONS Engineering Science, INC.

Client Sample ID: P-4

GC Volatiles

Lot-Sample #...:	D8K200146-004	**Work Order #...:**	CNMCW105	**Matrix.....:** SO
Date Sampled...:	11/18/98 15:45	**Date Received..:**	11/20/98	
Prep Date.....:	11/23/98	**Analysis Date..:**	11/23/98	
Prep Batch #...:	8329140	**Analysis Time..:**	15:29	
Dilution Factor:	1			
% Moisture.....:	14	**Method.....:**	SW846 8020A	

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	ND	0.0012	mg/kg
Chlorobenzene	ND	0.0023	mg/kg
1,2-Dichlorobenzene	ND	0.0046	mg/kg
1,3-Dichlorobenzene	ND	0.0046	mg/kg
1,4-Dichlorobenzene	ND	0.0035	mg/kg
Ethylbenzene	ND	0.0023	mg/kg
Toluene	**0.0012 F**	**0.0023**	**mg/kg**
Xylenes (total)	ND	0.0023	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	100	(34 - 175)
Fluorobenzene	97	(34 - 175)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

F The analyte was identified but the value was below the RL and above the MDL.

1C

PARSONS Engineering Science, INC.

Client Sample ID: P-4

GC Volatiles

Lot-Sample #...:	D8K200146-004	**Work Order #...:**	CNMCW107	**Matrix.....:**	SO
Date Sampled...:	11/18/98 15:45	**Date Received..:**	11/20/98		
Prep Date.....:	11/23/98	**Analysis Date..:**	11/23/98		
Prep Batch #...:	8329140	**Analysis Time..:**	15:29		
Dilution Factor:	1				
% Moisture.....:	14	**Method.....:**	SW846 8020A		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	ND	0.0012	mg/kg
Chlorobenzene	ND	0.0023	mg/kg
1,2-Dichlorobenzene	ND	0.0046	mg/kg
1,3-Dichlorobenzene	ND	0.0046	mg/kg
1,4-Dichlorobenzene	ND	0.0035	mg/kg
Ethylbenzene	ND	0.0023	mg/kg
Toluene	**0.0013 F**	**0.0023**	**mg/kg**
Xylenes (total)	ND	0.0023	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	103	(34 - 175)
Fluorobenzene	99	(34 - 175)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

F The analyte was identified but the value was below the RL and above the MDL.

2C

PARSONS Engineering Science, INC.

Client Sample ID: P-5

GC Volatiles

Lot-Sample #...: D8K200146-005 Work Order #...: CNMCX105 Matrix.....: SO
Date Sampled...: 11/18/98 15:55 Date Received..: 11/20/98
Prep Date.....: 11/23/98 Analysis Date..: 11/23/98
Prep Batch #...: 8329140 Analysis Time..: 16:04
Dilution Factor: 1
% Moisture.....: 10 Method.....: SW846 8020A

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	ND	0.0011	mg/kg
Chlorobenzene	ND	0.0022	mg/kg
1,2-Dichlorobenzene	ND	0.0044	mg/kg
1,3-Dichlorobenzene	ND	0.0044	mg/kg
1,4-Dichlorobenzene	ND	0.0033	mg/kg
Ethylbenzene	ND	0.0022	mg/kg
Toluene	ND	0.0022	mg/kg
Xylenes (total)	ND	0.0022	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	102	(34 - 175)
Fluorobenzene	97	(34 - 175)

NOTE(S):
Results and reporting limits have been adjusted for dry weight.

PARSONS Engineering Science, INC.

Client Sample ID: P-6

GC Volatiles

Lot-Sample #...:	D8K200146-006	Work Order #...:	CNMD0105	Matrix.....:	SO
Date Sampled...:	11/18/98 16:10	Date Received..:	11/20/98		
Prep Date.....:	11/23/98	Analysis Date..:	11/23/98		
Prep Batch #...:	8329140	Analysis Time..:	17:16		
Dilution Factor:	1				
% Moisture.....:	13	Method.....:	SW846 8020A		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	**0.083**	**0.0012**	**mg/kg**
Chlorobenzene	ND	0.0023	mg/kg
1,2-Dichlorobenzene	ND	0.0046	mg/kg
1,3-Dichlorobenzene	ND	0.0046	mg/kg
1,4-Dichlorobenzene	ND	0.0035	mg/kg
Ethylbenzene	**0.14**	**0.0023**	**mg/kg**
Toluene	**0.060**	**0.0023**	**mg/kg**
Xylenes (total)	**0.29**	**0.0023**	**mg/kg**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	156	(34 - 175)
Fluorobenzene	106	(34 - 175)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

1C

PARSONS Engineering Science, INC.

Client Sample ID: P-6

GC Volatiles

Lot-Sample #...: D8K200146-006 Work Order #...: CNMD0106 Matrix.....: SO
Date Sampled...: 11/18/98 16:10 Date Received..: 11/20/98
Prep Date.....: 11/23/98 Analysis Date..: 11/25/98
Prep Batch #...: 8329140 Analysis Time..: 17:16
Dilution Factor: 1
% Moisture.....: 13 Method.....: SW846 8020A

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	**0.094**	**0.0012**	**mg/kg**
Chlorobenzene	ND	0.0023	mg/kg
1,2-Dichlorobenzene	ND	0.0046	mg/kg
1,3-Dichlorobenzene	ND	0.0046	mg/kg
1,4-Dichlorobenzene	ND	0.0035	mg/kg
Ethylbenzene	**0.15**	**0.0023**	**mg/kg**
Toluene	**0.078**	**0.0023**	**mg/kg**
Xylenes (total)	**0.34**	**0.0023**	**mg/kg**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	93	(34 - 175)
Fluorobenzene	96	(34 - 175)

NOTE(S):

esults and reporting limits have been adjusted for dry weight.

2C

PARSONS Engineering Science, INC.

Client Sample ID: P-7

GC Volatiles

Lot-Sample #...:	D8K200146-007	Work Order #...:	CNMD1105	Matrix.....:	SO
Date Sampled...:	11/18/98 16:30	Date Received..:	11/20/98		
Prep Date.....:	11/23/98	Analysis Date..:	11/23/98		
Prep Batch #...:	8329140	Analysis Time..:	17:51		
Dilution Factor:	1				
% Moisture.....:	13	Method.....:	SW846 8020A		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	**0.079**	**0.0012**	**mg/kg**
Chlorobenzene	ND	0.0023	mg/kg
1,2-Dichlorobenzene	ND	0.0046	mg/kg
1,3-Dichlorobenzene	ND	0.0046	mg/kg
1,4-Dichlorobenzene	ND	0.0035	mg/kg
Ethylbenzene	**0.12**	**0.0023**	**mg/kg**
Toluene	**0.043**	**0.0023**	**mg/kg**
Xylenes (total)	**0.27**	**0.0023**	**mg/kg**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	127	(34 - 175)
Fluorobenzene	108	(34 - 175)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

1C

PARSONS Engineering Science, INC.

Client Sample ID: P-7

GC Volatiles

Lot-Sample #...: D8K200146-007 Work Order #...: CNMD1106 Matrix.....: SO
Date Sampled...: 11/18/98 16:30 Date Received..: 11/20/98
Prep Date.....: 11/23/98 Analysis Date..: 11/23/98
Prep Batch #...: 8329140 Analysis Time..: 17:51
Dilution Factor: 1
% Moisture.....: 13 Method.....: SW846 8020A

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	**0.083**	**0.0012**	**mg/kg**
Chlorobenzene	ND	0.0023	mg/kg
1,2-Dichlorobenzene	ND	0.0046	mg/kg
1,3-Dichlorobenzene	ND	0.0046	mg/kg
1,4-Dichlorobenzene	ND	0.0035	mg/kg
Ethylbenzene	**0.12**	**0.0023**	**mg/kg**
Toluene	**0.053**	**0.0023**	**mg/kg**
Xylenes (total)	**0.29**	**0.0023**	**mg/kg**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	100	(34 - 175)
Fluorobenzene	110	(34 - 175)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

2C

PARSONS Engineering Science, INC.

Client Sample ID: P-9

GC Volatiles

Lot-Sample #...:	D8K200146-008	Work Order #...:	CNMD2105	Matrix.....:	SO
Date Sampled...:	11/18/98 17:00	Date Received..:	11/20/98		
Prep Date.....:	11/23/98	Analysis Date..:	11/23/98		
Prep Batch #...:	8329140	Analysis Time..:	18:27		
Dilution Factor:	1				
% Moisture.....:	16	Method.....:	SW846 8020A		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	**0.0025**	**0.0012**	**mg/kg**
Chlorobenzene	ND	0.0024	mg/kg
1,2-Dichlorobenzene	**0.0026 F**	**0.0047**	**mg/kg**
1,3-Dichlorobenzene	ND	0.0047	mg/kg
1,4-Dichlorobenzene	**0.0012 F**	**0.0036**	**mg/kg**
Ethylbenzene	**0.0014 F**	**0.0024**	**mg/kg**
Toluene	**0.0011 F**	**0.0024**	**mg/kg**
Xylenes (total)	**0.0037**	**0.0024**	**mg/kg**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	102	(34 - 175)
Fluorobenzene	101	(34 - 175)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

F The analyte was identified but the value was below the RL and above the MDL.

IC

PARSONS Engineering Science, INC.

Client Sample ID: P-9

GC Volatiles

Lot-Sample #...: D8K200146-008 Work Order #...: CNMD2106 Matrix.....: SO
Date Sampled...: 11/18/98 17:00 Date Received..: 11/20/98
Prep Date.....: 11/23/98 Analysis Date..: 11/23/98
Prep Batch #...: 8329140 Analysis Time..: 18:27
Dilution Factor: 1
% Moisture.....: 16 Method.....: SW846 8020A

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	**0.0020**	**0.0012**	**mg/kg**
Chlorobenzene	ND	0.0024	mg/kg
1,2-Dichlorobenzene	ND	0.0047	mg/kg
1,3-Dichlorobenzene	ND	0.0047	mg/kg
1,4-Dichlorobenzene	ND	0.0036	mg/kg
Ethylbenzene	**0.00095 F**	**0.0024**	**mg/kg**
Toluene	**0.0030**	**0.0024**	**mg/kg**
Xylenes (total)	**0.0042**	**0.0024**	**mg/kg**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	104	(34 - 175)
Fluorobenzene	105	(34 - 175)

NOTE(S):

esults and reporting limits have been adjusted for dry weight.

F The analyte was identified but the value was below the RL and above the MDL.

2C

PARSONS Engineering Science, INC.

Client Sample ID: P-8

GC Volatiles

Lot-Sample #...: D8K200146-009	**Work Order #...:** CNMD3106	**Matrix.....:** SO	
Date Sampled...: 11/18/98 16:45	**Date Received..:** 11/20/98		
Prep Date.....: 11/24/98	**Analysis Date..:** 11/24/98		
Prep Batch #...: 8329209	**Analysis Time..:** 12:29		
Dilution Factor: 1			
% Moisture.....: 17	**Method.....:** SW846 8020A		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	**0.68**	**0.0012**	**mg/kg**
Chlorobenzene	ND	0.0024	mg/kg
1,2-Dichlorobenzene	ND	0.0048	mg/kg
1,3-Dichlorobenzene	ND	0.0048	mg/kg
1,4-Dichlorobenzene	ND	0.0036	mg/kg
Ethylbenzene	**0.44**	**0.0024**	**mg/kg**
Toluene	**2.0**	**0.0024**	**mg/kg**
Xylenes (total)	**2.5**	**0.0024**	**mg/kg**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	91	(34 - 175)
Fluorobenzene	88	(34 - 175)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

1C

PARSONS Engineering Science, INC.

Client Sample ID: P-8

GC Volatiles

Lot-Sample #...: D8K200146-009 Work Order #...: CNMD3107 Matrix.....: SO
Date Sampled...: 11/18/98 16:45 Date Received..: 11/20/98
Prep Date.....: 11/24/98 Analysis Date..: 11/24/98
Prep Batch #...: 8329209 Analysis Time..: 12:29
Dilution Factor: 1
% Moisture.....: 17 Method.....: SW846 8020A

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	**0.73**	**0.0012**	**mg/kg**
Chlorobenzene	ND	0.0024	mg/kg
1,2-Dichlorobenzene	ND	0.0048	mg/kg
1,3-Dichlorobenzene	ND	0.0048	mg/kg
1,4-Dichlorobenzene	ND	0.0036	mg/kg
Ethylbenzene	**0.47**	**0.0024**	**mg/kg**
Toluene	**2.2**	**0.0024**	**mg/kg**
Xylenes (total)	**2.8**	**0.0024**	**mg/kg**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	90	(34 - 175)
Fluorobenzene	89	(34 - 175)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

2C

PARSONS Engineering Science, INC.

Client Sample ID: P-10

GC Volatiles

Lot-Sample #...: D8K200146-010	Work Order #...: CNMD610E	Matrix.....: SO	
Date Sampled...: 11/19/98 07:25	Date Received..: 11/20/98		
Prep Date.....: 11/24/98	Analysis Date..: 11/24/98		
Prep Batch #...: 8329209	Analysis Time..: 14:04		
Dilution Factor: 5			
% Moisture.....: 18	Method.....: SW846 8020A		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	**0.17**	**0.0061**	**mg/kg**
Chlorobenzene	ND	0.012	mg/kg
1,2-Dichlorobenzene	ND	0.024	mg/kg
1,3-Dichlorobenzene	ND	0.024	mg/kg
1,4-Dichlorobenzene	ND	0.018	mg/kg
Ethylbenzene	**2.5**	**0.012**	**mg/kg**
Toluene	**1.4**	**0.012**	**mg/kg**
Xylenes (total)	**12**	**0.012**	**mg/kg**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	0.0 DIL,*	(34 - 175)
Fluorobenzene	0.0 DIL,*	(34 - 175)

NOTE(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

* Surrogate recovery is outside stated control limits.

Results and reporting limits have been adjusted for dry weight.

1C

PARSONS Engineering Science, INC.

Client Sample ID: P-10

GC Volatiles

Lot-Sample #...: D8K200146-010 Work Order #...: CNMD610H Matrix.....: SO
Date Sampled...: 11/19/98 07:25 Date Received..: 11/20/98
Prep Date.....: 11/24/98 Analysis Date..: 11/24/98
Prep Batch #...: 8329209 Analysis Time..: 14:04
Dilution Factor: 5
% Moisture.....: 18 Method.....: SW846 8020A

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	**0.20**	**0.0061**	**mg/kg**
Chlorobenzene	ND	0.012	mg/kg
1,2-Dichlorobenzene	ND	0.024	mg/kg
1,3-Dichlorobenzene	ND	0.024	mg/kg
1,4-Dichlorobenzene	ND	0.018	mg/kg
Ethylbenzene	**2.6**	**0.012**	**mg/kg**
Toluene	**1.7**	**0.012**	**mg/kg**
Xylenes (total)	**13**	**0.012**	**mg/kg**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	0.0 DIL,*	(34 - 175)
Fluorobenzene	0.0 DIL,*	(34 - 175)

NOTE(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

* Surrogate recovery is outside stated control limits.

Results and reporting limits have been adjusted for dry weight.

2C

PARSONS Engineering Science, INC.

Client Sample ID: P-11

GC Volatiles

Lot-Sample #...:	D8K200146-011	**Work Order #...:**	CNMD7105	**Matrix.....:**	SO
Date Sampled...:	11/19/98 08:20	**Date Received..:**	11/20/98		
Prep Date.....:	11/24/98	**Analysis Date..:**	11/24/98		
Prep Batch #...:	8329209	**Analysis Time..:**	15:50		
Dilution Factor:	1				
% Moisture.....:	14	**Method.....:**	SW846 8020A		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	**0.034**	**0.0012**	**mg/kg**
Chlorobenzene	ND	0.0023	mg/kg
1,2-Dichlorobenzene	ND	0.0046	mg/kg
1,3-Dichlorobenzene	ND	0.0046	mg/kg
1,4-Dichlorobenzene	ND	0.0035	mg/kg
Ethylbenzene	**0.28**	**0.0023**	**mg/kg**
Toluene	**0.041**	**0.0023**	**mg/kg**
Xylenes (total)	**0.85**	**0.0023**	**mg/kg**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	81	(34 - 175)
Fluorobenzene	76	(34 - 175)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

1C

PARSONS Engineering Science, INC.

Client Sample ID: P-11

GC Volatiles

Lot-Sample #...: D8K200146-011 Work Order #...: CNMD7106 Matrix.....: SO
Date Sampled...: 11/19/98 08:20 Date Received..: 11/20/98
Prep Date.....: 11/24/98 Analysis Date..: 11/24/98
Prep Batch #...: 8329209 Analysis Time..: 15:50
Dilution Factor: 1
% Moisture.....: 14 Method.....: SW846 8020A

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	**0.026**	**0.0012**	**mg/kg**
Chlorobenzene	ND	0.0023	mg/kg
1,2-Dichlorobenzene	ND	0.0046	mg/kg
1,3-Dichlorobenzene	ND	0.0046	mg/kg
1,4-Dichlorobenzene	ND	0.0035	mg/kg
Ethylbenzene	**0.24**	**0.0023**	**mg/kg**
Toluene	**0.087**	**0.0023**	**mg/kg**
Xylenes (total)	**0.99**	**0.0023**	**mg/kg**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	90	(34 - 175)
Fluorobenzene	83	(34 - 175)

NOTE(S):

esults and reporting limits have been adjusted for dry weight.

2C

PARSONS Engineering Science, INC.

Client Sample ID: P-12

GC Volatiles

Lot-Sample #...:	D8K200146-012	Work Order #...:	CNMD9105	Matrix.....:	SO
Date Sampled...:	11/19/98 08:30	Date Received..:	11/20/98		
Prep Date.....:	11/24/98	Analysis Date..:	11/24/98		
Prep Batch #...:	8329209	Analysis Time..:	16:26		
Dilution Factor:	1				
% Moisture.....:	10	Method.....:	SW846 8020A		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	**0.097**	**0.0011**	**mg/kg**
Chlorobenzene	ND	0.0022	mg/kg
1,2-Dichlorobenzene	ND	0.0045	mg/kg
1,3-Dichlorobenzene	ND	0.0045	mg/kg
1,4-Dichlorobenzene	ND	0.0033	mg/kg
Ethylbenzene	**0.10**	**0.0022**	**mg/kg**
Toluene	**0.28**	**0.0022**	**mg/kg**
Xylenes (total)	**0.56**	**0.0022**	**mg/kg**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	89	(34 - 175)
Fluorobenzene	84	(34 - 175)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

1C

PARSONS Engineering Science, INC.

Client Sample ID: P-12

GC Volatiles

Lot-Sample #...: D8K200146-012 Work Order #...: CNMD9106 Matrix.....: SO
Date Sampled...: 11/19/98 08:30 Date Received..: 11/20/98
Prep Date.....: 11/24/98 Analysis Date..: 11/24/98
Prep Batch #...: 8329209 Analysis Time..: 16:26
Dilution Factor: 1
% Moisture.....: 10 Method.....: SW846 8020A

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	**0.10**	**0.0011**	**mg/kg**
Chlorobenzene	ND	0.0022	mg/kg
1,2-Dichlorobenzene	ND	0.0045	mg/kg
1,3-Dichlorobenzene	ND	0.0045	mg/kg
1,4-Dichlorobenzene	ND	0.0033	mg/kg
Ethylbenzene	**0.12**	**0.0022**	**mg/kg**
Toluene	**0.31**	**0.0022**	**mg/kg**
Xylenes (total)	**0.64**	**0.0022**	**mg/kg**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	91	(34 - 175)
Fluorobenzene	87	(34 - 175)

NOTE(S):
Results and reporting limits have been adjusted for dry weight.

PARSONS Engineering Science, INC.

Client Sample ID: UT-4

GC Volatiles

Lot-Sample #...:	D8K200146-013	Work Order #...:	CNMDA105	Matrix.....:	SO
Date Sampled...:	11/19/98 09:10	Date Received..:	11/20/98		
Prep Date.....:	11/23/98	Analysis Date..:	11/23/98		
Prep Batch #...:	8329140	Analysis Time..:	19:03		
Dilution Factor:	1				
% Moisture.....:	21	Method.....:	SW846 8020A		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	**0.0081**	**0.0013**	**mg/kg**
Chlorobenzene	ND	0.0025	mg/kg
1,2-Dichlorobenzene	ND	0.0051	mg/kg
1,3-Dichlorobenzene	ND	0.0051	mg/kg
1,4-Dichlorobenzene	ND	0.0038	mg/kg
Ethylbenzene	**0.0013 F**	**0.0025**	**mg/kg**
Toluene	**0.00065 F**	**0.0025**	**mg/kg**
Xylenes (total)	**0.0038**	**0.0025**	**mg/kg**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	99	(34 - 175)
Fluorobenzene	103	(34 - 175)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

F The analyte was identified but the value was below the RL and above the MDL.

1C

PARSONS Engineering Science, INC.

Client Sample ID: UT-4

GC Volatiles

Lot-Sample #...: D8K200146-013 Work Order #...: CNMDA106 Matrix.....: SO
Date Sampled...: 11/19/98 09:10 Date Received..: 11/20/98
Prep Date.....: 11/23/98 Analysis Date..: 11/23/98
Prep Batch #...: 8329140 Analysis Time..: 19:03
Dilution Factor: 1
% Moisture.....: 21 Method.....: SW846 8020A

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	**0.0069**	**0.0013**	**mg/kg**
Chlorobenzene	ND	0.0025	mg/kg
1,2-Dichlorobenzene	ND	0.0051	mg/kg
1,3-Dichlorobenzene	ND	0.0051	mg/kg
1,4-Dichlorobenzene	ND	0.0038	mg/kg
Ethylbenzene	**0.0013 F**	**0.0025**	**mg/kg**
Toluene	**0.00061 F**	**0.0025**	**mg/kg**
Xylenes (total)	**0.0041**	**0.0025**	**mg/kg**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	98	(34 - 175)
Fluorobenzene	107	(34 - 175)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

F The analyte was identified but the value was below the RL and above the MDL.

2C

PARSONS Engineering Science, INC.

Client Sample ID: UT-3

GC Volatiles

Lot-Sample #...:	D8K200146-014	**Work Order #...:**	CNMDF105	**Matrix.....:**	SO
Date Sampled...:	11/19/98 09:30	**Date Received..:**	11/20/98		
Prep Date.....:	11/23/98	**Analysis Date..:**	11/23/98		
Prep Batch #...:	8329140	**Analysis Time..:**	19:38		
Dilution Factor:	1				
% Moisture.....:	20	**Method.....:**	SW846 8020A		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	ND	0.0012	mg/kg
Chlorobenzene	ND	0.0025	mg/kg
1,2-Dichlorobenzene	ND	0.0050	mg/kg
1,3-Dichlorobenzene	ND	0.0050	mg/kg
1,4-Dichlorobenzene	ND	0.0037	mg/kg
Ethylbenzene	ND	0.0025	mg/kg
Toluene	ND	0.0025	mg/kg
Xylenes (total)	ND	0.0025	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	101	(34 - 175)
Fluorobenzene	99	(34 - 175)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

PARSONS Engineering Science, INC.

Client Sample ID: UT-2

GC Volatiles

Lot-Sample #...:	D8K200146-015	Work Order #...:	CNMDG105	Matrix.....:	SO
Date Sampled...:	11/19/98 11:10	Date Received..:	11/20/98		
Prep Date.....:	11/23/98	Analysis Date..:	11/23/98		
Prep Batch #...:	8329140	Analysis Time..:	20:14		
Dilution Factor:	1				
% Moisture.....:	12	Method.....:	SW846 8020A		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	ND	0.0011	mg/kg
Chlorobenzene	ND	0.0023	mg/kg
1,2-Dichlorobenzene	ND	0.0045	mg/kg
1,3-Dichlorobenzene	ND	0.0045	mg/kg
1,4-Dichlorobenzene	ND	0.0034	mg/kg
Ethylbenzene	ND	0.0023	mg/kg
Toluene	**0.00080 F**	**0.0023**	**mg/kg**
Xylenes (total)	ND	0.0023	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	100	(34 - 175)
Fluorobenzene	104	(34 - 175)

NOTE(S):

esults and reporting limits have been adjusted for dry weight.

F The analyte was identified but the value was below the RL and above the MDL.

1C

PARSONS Engineering Science, INC.

Client Sample ID: UT-2

GC Volatiles

Lot-Sample #...:	D8K200146-015	**Work Order #...:**	CNMDG106	**Matrix.....:**	SO
Date Sampled...:	11/19/98 11:10	**Date Received..:**	11/20/98		
Prep Date.....:	11/23/98	**Analysis Date..:**	11/23/98		
Prep Batch #...:	8329140	**Analysis Time..:**	20:14		
Dilution Factor:	1				
% Moisture.....:	12	**Method.....:**	SW846 8020A		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	ND	0.0011	mg/kg
Chlorobenzene	ND	0.0023	mg/kg
1,2-Dichlorobenzene	ND	0.0045	mg/kg
1,3-Dichlorobenzene	ND	0.0045	mg/kg
1,4-Dichlorobenzene	ND	0.0034	mg/kg
Ethylbenzene	ND	0.0023	mg/kg
Toluene	**0.014**	**0.0023**	**mg/kg**
Xylenes (total)	ND	0.0023	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	101	(34 - 175)
Fluorobenzene	108	(34 - 175)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

2C

PARSONS Engineering Science, INC.

Client Sample ID: UT-1

GC Volatiles

Lot-Sample #...: D8K200146-016 Work Order #...: CNMDK105 Matrix.....: SO
Date Sampled...: 11/19/98 12:05 Date Received..: 11/20/98
Prep Date.....: 11/24/98 Analysis Date..: 11/24/98
Prep Batch #...: 8329209 Analysis Time..: 17:02
Dilution Factor: 5
% Moisture.....: 4.8 Method.....: SW846 8020A

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	ND	0.0053	mg/kg
Chlorobenzene	ND	0.011	mg/kg
1,2-Dichlorobenzene	ND	0.026	mg/kg
1,3-Dichlorobenzene	ND	0.026	mg/kg
1,4-Dichlorobenzene	ND	0.016	mg/kg
Ethylbenzene	ND	0.011	mg/kg
Toluene	ND	0.011	mg/kg
Xylenes (total)	ND	0.011	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	0.0 DIL,*	(34 - 175)
Fluorobenzene	0.0 DIL,*	(34 - 175)

NOTE(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

* Surrogate recovery is outside stated control limits.

Results and reporting limits have been adjusted for dry weight.

PARSONS Engineering Science, INC.

Client Sample ID: P-1

GC Volatiles

Lot-Sample #...:	D8K200146-001	Work Order #...:	CNMA3104	Matrix.....:	SO
Date Sampled...:	11/18/98 14:50	Date Received..:	11/20/98		
Prep Date.....:	11/24/98	Analysis Date..:	11/24/98		
Prep Batch #...:	8334296	Analysis Time..:	12:52		
Dilution Factor:	1				
% Moisture.....:	13	Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	1.3 B	1.2	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	86	(64 - 148)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

B The analyte was found in the associated blank, as well as in the sample.

PARSONS Engineering Science, INC.

Client Sample ID: P-2

GC Volatiles

Lot-Sample #...:	D8K200146-002	Work Order #...:	CNMCN104	Matrix.....:	SO
Date Sampled...:	11/18/98 15:05	Date Received..:	11/20/98		
Prep Date.....:	11/24/98	Analysis Date..:	11/24/98		
Prep Batch #...:	8334296	Analysis Time..:	13:37		
Dilution Factor:	1				
% Moisture.....:	14	Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	0.75 F,B	1.2	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	85	(64 - 148)

NOTE(S):

F The analyte was identified but the value was below the RL and above the MDL.

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

B The analyte was found in the associated blank, as well as in the sample.

PARSONS Engineering Science, INC.

Client Sample ID: P-3

GC Volatiles

Lot-Sample #...:	D8K200146-003	Work Order #...:	CNMCP104	Matrix.....:	SO
Date Sampled...:	11/18/98 15:30	Date Received..:	11/20/98		
Prep Date.....:	11/24/98	Analysis Date..:	11/24/98		
Prep Batch #...:	8334296	Analysis Time..:	14:23		
Dilution Factor:	1				
% Moisture.....:	11	Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	0.46 F,B	1.1	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	87	(64 - 148)

NOTE(S):

F The analyte was identified but the value was below the RL and above the MDL.

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

B The analyte was found in the associated blank, as well as in the sample.

PARSONS Engineering Science, INC.

Client Sample ID: P-4

GC Volatiles

Lot-Sample #...:	D8K200146-004	Work Order #...:	CNMCW104	Matrix.....:	SO
Date Sampled...:	11/18/98 15:45	Date Received..:	11/20/98		
Prep Date.....:	11/24/98	Analysis Date..:	11/24/98		
Prep Batch #...:	8334296	Analysis Time..:	15:08		
Dilution Factor:	1				
% Moisture.....:	14	Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	0.37 F,B	1.2	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	90	(64 - 148)

NOTE(S):

F The analyte was identified but the value was below the RL and above the MDL.

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

B The analyte was found in the associated blank, as well as in the sample.

PARSONS Engineering Science, INC.

Client Sample ID: P-5

GC Volatiles

Lot-Sample #...:	D8K200146-005	Work Order #...:	CNMCX104	Matrix.....:	SO
Date Sampled...:	11/18/98 15:55	Date Received..:	11/20/98		
Prep Date.....:	11/24/98	Analysis Date..:	11/24/98		
Prep Batch #...:	8334296	Analysis Time..:	15:53		
Dilution Factor:	1				
% Moisture.....:	10	Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	0.30 F,B	1.1	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	86	(64 - 148)

NOTE(S):

F The analyte was identified but the value was below the RL and above the MDL.

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

B The analyte was found in the associated blank, as well as in the sample.

PARSONS Engineering Science, INC.

Client Sample ID: P-6

GC Volatiles

Lot-Sample #...:	D8K200146-006	Work Order #...:	CNMD0104	Matrix.....:	SO
Date Sampled...:	11/18/98 16:10	Date Received..:	11/20/98		
Prep Date.....:	11/24/98	Analysis Date..:	11/24/98		
Prep Batch #...:	8334296	Analysis Time..:	16:39		
Dilution Factor:	1				
% Moisture.....:	13	Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	5.4 B	1.2	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	94	(64 - 148)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics that are similar to weathered gasoline.

B The analyte was found in the associated blank, as well as in the sample.

PARSONS Engineering Science, INC.

Client Sample ID: P-7

GC Volatiles

Lot-Sample #...:	D8K200146-007	Work Order #...:	CNMD1104	Matrix.....:	SO
Date Sampled...:	11/18/98 16:30	Date Received..:	11/20/98		
Prep Date.....:	11/24/98	Analysis Date..:	11/24/98		
Prep Batch #...:	8334296	Analysis Time..:	17:24		
Dilution Factor:	1				
% Moisture.....:	13	Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	7.5 B	1.2	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	100	(64 - 148)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics that are similar to weathered gasoline.

B The analyte was found in the associated blank, as well as in the sample.

PARSONS Engineering Science, INC.

Client Sample ID: P-9

GC Volatiles

Lot-Sample #...:	D8K200146-008	Work Order #...:	CNMD2104	Matrix.....:	SO
Date Sampled...:	11/18/98 17:00	Date Received..:	11/20/98		
Prep Date.....:	11/24/98	Analysis Date..:	11/24/98		
Prep Batch #...:	8334296	Analysis Time..:	18:54		
Dilution Factor:	1				
% Moisture.....:	16	Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	0.94 F,B	1.2	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	85	(64 - 148)

NOTE(S):

F The analyte was identified but the value was below the RL and above the MDL.

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

B The analyte was found in the associated blank, as well as in the sample.

PARSONS Engineering Science, INC.

Client Sample ID: P-8

GC Volatiles

Lot-Sample #...:	D8K200146-009	Work Order #...:	CNMD3104	Matrix.....:	SO
Date Sampled...:	11/18/98 16:45	Date Received..:	11/20/98		
Prep Date.....:	11/24/98	Analysis Date..:	11/24/98		
Prep Batch #...:	8334296	Analysis Time..:	19:39		
Dilution Factor:	1				
% Moisture.....:	17	Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	43 B	1.2	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	89	(64 - 148)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics that are similar to gasoline.

B The analyte was found in the associated blank, as well as in the sample.

PARSONS Engineering Science, INC.

Client Sample ID: P-10

GC Volatiles

Lot-Sample #...:	D8K200146-010	Work Order #...:	CNMD6104	Matrix.....:	SO
Date Sampled...:	11/19/98 07:25	Date Received..:	11/20/98		
Prep Date.....:	11/24/98	Analysis Date..:	11/24/98		
Prep Batch #...:	8334296	Analysis Time..:	20:24		
Dilution Factor:	5				
% Moisture.....:	18	Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	150 B	6.1	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	0.0 DIL,*	(64 - 148)

NOTE(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

* Surrogate recovery is outside stated control limits.

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics that are similar to weathered gasoline.

B The analyte was found in the associated blank, as well as in the sample.

PARSONS Engineering Science, INC.

Client Sample ID: P-11

GC Volatiles

Lot-Sample #...:	D8K200146-011	Work Order #...:	CNMD7104	Matrix.....:	SO
Date Sampled...:	11/19/98 08:20	Date Received..:	11/20/98		
Prep Date.....:	11/24/98	Analysis Date..:	11/24/98		
Prep Batch #...:	8334296	Analysis Time..:	22:39		
Dilution Factor:	1				
% Moisture.....:	14	Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	15 B	1.2	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	82	(64 - 148)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics that are similar to weathered gasoline.

B The analyte was found in the associated blank, as well as in the sample.

PARSONS Engineering Science, INC.

Client Sample ID: P-12

GC Volatiles

Lot-Sample #...:	D8K200146-012	Work Order #...:	CNMD9104	Matrix.....:	SO
Date Sampled...:	11/19/98 08:30	Date Received..:	11/20/98		
Prep Date.....:	11/24/98	Analysis Date..:	11/24/98		
Prep Batch #...:	8334296	Analysis Time..:	23:23		
Dilution Factor:	1				
% Moisture.....:	10	Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	8.3 B	1.1	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	96	(64 - 148)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics that are similar to weathered gasoline.

B The analyte was found in the associated blank, as well as in the sample.

PARSONS Engineering Science, INC.

Client Sample ID: UT-4

GC Volatiles

Lot-Sample #...:	D8K200146-013	Work Order #...:	CNMDA104	Matrix.....:	SO
Date Sampled...:	11/19/98 09:10	Date Received..:	11/20/98		
Prep Date.....:	11/24/98	Analysis Date..:	11/25/98		
Prep Batch #...:	8334296	Analysis Time..:	00:08		
Dilution Factor:	1				
% Moisture.....:	21	Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	1.4 B	1.3	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	84	(64 - 148)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

B The analyte was found in the associated blank, as well as in the sample.

PARSONS Engineering Science, INC.

Client Sample ID: UT-3

GC Volatiles

Lot-Sample #...:	D8K200146-014	Work Order #...:	CNMDF104	Matrix.....:	SO
Date Sampled...:	11/19/98 09:30	Date Received..:	11/20/98		
Prep Date.....:	11/24/98	Analysis Date..:	11/25/98		
Prep Batch #...:	8334296	Analysis Time..:	08:08		
Dilution Factor:	1				
% Moisture.....:	20	Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	0.22 F,B	1.2	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	100	(64 - 148)

NOTE(S):

F The analyte was identified but the value was below the RL and above the MDL.

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

B The analyte was found in the associated blank, as well as in the sample.

PARSONS Engineering Science, INC.

Client Sample ID: UT-2

GC Volatiles

Lot-Sample #...:	D8K200146-015	Work Order #...:	CNMDG104	Matrix.....:	SO
Date Sampled...:	11/19/98 11:10	Date Received..:	11/20/98		
Prep Date.....:	11/24/98	Analysis Date..:	11/25/98		
Prep Batch #...:	8334296	Analysis Time..:	01:37		
Dilution Factor:	1				
% Moisture.....:	12	Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	1.1 F,B	1.1	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	83	(64 - 148)

NOTE(S):

F The analyte was identified but the value was below the RL and above the MDL.

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

B The analyte was found in the associated blank, as well as in the sample.

PARSONS Engineering Science, INC.

Client Sample ID: UT-1

GC Volatiles

Lot-Sample #...:	D8K200146-016	Work Order #...:	CNMDK104	Matrix.....:	SO
Date Sampled...:	11/19/98 12:05	Date Received..:	11/20/98		
Prep Date.....:	11/24/98	Analysis Date..:	11/25/98		
Prep Batch #...:	8334296	Analysis Time..:	03:07		
Dilution Factor:	5				
% Moisture.....:	4.8	Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	160 B	5.3	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	0.0 DIL,*	(64 - 148)

NOTE(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

* Surrogate recovery is outside stated control limits.

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics that are similar to weathered gasoline.

B The analyte was found in the associated blank, as well as in the sample.

PARSONS Engineering Science, INC.

Client Sample ID: P-1

GC Semivolatiles

Lot-Sample #...:	D8K200146-001	Work Order #...:	CNMA3103	Matrix.....:	SO
Date Sampled...:	11/18/98 14:50	Date Received..:	11/20/98		
Prep Date.....:	12/02/98	Analysis Date..:	12/16/98		
Prep Batch #...:	8336177	Analysis Time..:	12:10		
Dilution Factor:	1				
% Moisture.....:	13	Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	15	4.6	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	89	(47 - 142)
n-Octacosane	82	(25 - 162)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

Sample resembles a hydrocarbon product occurring within the n-alkane range of C10 to C28.

PARSONS Engineering Science, INC.

Client Sample ID: P-4

GC Semivolatiles

Lot-Sample #...:	D8K200146-004	Work Order #...:	CNMCW103	Matrix.....:	SO
Date Sampled...:	11/18/98 15:45	Date Received..:	11/20/98		
Prep Date.....:	12/02/98	Analysis Date..:	12/16/98		
Prep Batch #...:	8336177	Analysis Time..:	15:21		
Dilution Factor:	1				
% Moisture.....:	14	Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	20	4.6	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	89	(47 - 142)
n-Octacosane	59	(25 - 162)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

Sample resembles a hydrocarbon product occurring within the n-alkane range of C10 to C28.

PARSONS Engineering Science, INC.

Client Sample ID: P-5

GC Semivolatiles

Lot-Sample #...:	D8K200146-005	Work Order #...:	CNMCX103	Matrix.....:	SO
Date Sampled...:	11/18/98 15:55	Date Received..:	11/20/98		
Prep Date.....:	12/02/98	Analysis Date..:	12/16/98		
Prep Batch #...:	8336177	Analysis Time..:	17:15		
Dilution Factor:	1				
% Moisture.....:	10	Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	24	4.4	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	95	(47 - 142)
n-Octacosane	84	(25 - 162)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

Sample resembles a hydrocarbon product occurring within the n-alkane range of C10 to C28.

PARSONS Engineering Science, INC.

Client Sample ID: P-2

GC Semivolatiles

Lot-Sample #...:	D8K200146-002	Work Order #...:	CNMCN103	Matrix.....:	SO
Date Sampled...:	11/18/98 15:05	Date Received..:	11/20/98		
Prep Date.....:	12/02/98	Analysis Date..:	12/16/98		
Prep Batch #...:	8336177	Analysis Time..:	14:05		
Dilution Factor:	1				
% Moisture.....:	14	Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	8.0	4.6	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	91	(47 - 142)
n-Octacosane	102	(25 - 162)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

Sample resembles a hydrocarbon product occurring within the n-alkane range of C10 to C28.

PARSONS Engineering Science, INC.

Client Sample ID: P-3

GC Semivolatiles

Lot-Sample #...:	D8K200146-003	Work Order #...:	CNMCP103	Matrix.....:	SO
Date Sampled...:	11/18/98 15:30	Date Received..:	11/20/98		
Prep Date.....:	12/02/98	Analysis Date..:	12/16/98		
Prep Batch #...:	8336177	Analysis Time..:	14:43		
Dilution Factor:	1				
% Moisture.....:	11	Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	13	4.5	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	94	(47 - 142)
n-Octacosane	101	(25 - 162)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

Sample resembles a hydrocarbon product occurring within the n-alkane range of C10 to C28.

PARSONS Engineering Science, INC.

Client Sample ID: P-6

GC Semivolatiles

Lot-Sample #...:	D8K200146-006	Work Order #...:	CNMD0103	Matrix.....:	SO
Date Sampled...:	11/18/98 16:10	Date Received..:	11/20/98		
Prep Date.....:	12/02/98	Analysis Date..:	12/13/98		
Prep Batch #...:	8336177	Analysis Time..:	08:01		
Dilution Factor:	10				
% Moisture.....:	13	Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	390	46	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	0.0 DIL,*	(47 - 142)
n-Octacosane	0.0 DIL,*	(25 - 162)

NOTE(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

* Surrogate recovery is outside stated control limits.

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

Sample resembles a hydrocarbon product occurring within the n-alkane range of C10 to C28.

PARSONS Engineering Science, INC.

Client Sample ID: P-7

GC Semivolatiles

Lot-Sample #...:	D8K200146-007	Work Order #...:	CNMD1103	Matrix.....:	SO
Date Sampled...:	11/18/98 16:30	Date Received..:	11/20/98		
Prep Date.....:	12/02/98	Analysis Date..:	12/13/98		
Prep Batch #...:	8336177	Analysis Time..:	08:39		
Dilution Factor:	10				
% Moisture.....:	13	Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	480	46	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	0.0 DIL,*	(47 - 142)
n-Octacosane	0.0 DIL,*	(25 - 162)

NOTE(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

* Surrogate recovery is outside stated control limits.

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

Sample resembles a hydrocarbon product occurring within the n-alkane range of C10 to C28.

PARSONS Engineering Science, INC.

Client Sample ID: P-9

GC Semivolatiles

Lot-Sample #...:	D8K200146-008	Work Order #...:	CNMD2103	Matrix.....:	SO
Date Sampled...:	11/18/98 17:00	Date Received..:	11/20/98		
Prep Date.....:	12/02/98	Analysis Date..:	12/16/98		
Prep Batch #...:	8336177	Analysis Time..:	17:54		
Dilution Factor:	1				
% Moisture.....:	16	Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	15	4.7	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	90	(47 - 142)
n-Octacosane	73	(25 - 162)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

Sample resembles a hydrocarbon product occurring within the n-alkane range of C10 to C28.

PARSONS Engineering Science, INC.

Client Sample ID: P-8

GC Semivolatiles

Lot-Sample #...:	D8K200146-009	Work Order #...:	CNMD3103	Matrix.....:	SO
Date Sampled...:	11/18/98 16:45	Date Received..:	11/20/98		
Prep Date.....:	12/02/98	Analysis Date..:	12/13/98		
Prep Batch #...:	8336177	Analysis Time..:	11:11		
Dilution Factor:	1				
% Moisture.....:	17	Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	18	4.8	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	82	(47 - 142)
n-Octacosane	82	(25 - 162)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

Sample resembles a hydrocarbon product occurring within the n-alkane range of C10 to C28.

PARSONS Engineering Science, INC.

Client Sample ID: P-10

GC Semivolatiles

Lot-Sample #...:	D8K200146-010	Work Order #...:	CNMD6103	Matrix.....:	SO
Date Sampled...:	11/19/98 07:25	Date Received..:	11/20/98		
Prep Date.....:	12/02/98	Analysis Date..:	12/13/98		
Prep Batch #...:	8336177	Analysis Time..:	11:49		
Dilution Factor:	1				
% Moisture.....:	18	Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	51	4.9	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	96	(47 - 142)
n-Octacosane	56	(25 - 162)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

Sample resembles a hydrocarbon product occurring within the n-alkane range of C10 to C28.

PARSONS Engineering Science, INC.

Client Sample ID: P-11

GC Semivolatiles

Lot-Sample #...:	D8K200146-011	Work Order #...:	CNMD7103	Matrix.....:	SO
Date Sampled...:	11/19/98 08:20	Date Received..:	11/20/98		
Prep Date.....:	12/02/98	Analysis Date..:	12/16/98		
Prep Batch #...:	8336177	Analysis Time..:	18:32		
Dilution Factor:	1				
% Moisture.....:	14	Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	95	4.6	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	93	(47 - 142)
n-Octacosane	72	(25 - 162)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

Sample resembles a hydrocarbon product occurring within the n-alkane range of C10 to C28.

PARSONS Engineering Science, INC.

Client Sample ID: P-12

GC Semivolatiles

Lot-Sample #...:	D8K200146-012	Work Order #...:	CNMD9103	Matrix.....:	SO
Date Sampled...:	11/19/98 08:30	Date Received..:	11/20/98		
Prep Date.....:	12/02/98	Analysis Date..:	12/16/98		
Prep Batch #...:	8336177	Analysis Time..:	19:10		
Dilution Factor:	1				
% Moisture.....:	10	Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	41	4.5	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	88	(47 - 142)
n-Octacosane	67	(25 - 162)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

Sample resembles a hydrocarbon product occurring within the n-alkane range of C10 to C28.

PARSONS Engineering Science, INC.

Client Sample ID: UT-4

GC Semivolatiles

Lot-Sample #...:	D8K200146-013	Work Order #...:	CNMDA103	Matrix.....:	SO
Date Sampled...:	11/19/98 09:10	Date Received..:	11/20/98		
Prep Date.....:	12/02/98	Analysis Date..:	12/13/98		
Prep Batch #...:	8336177	Analysis Time..:	15:00		
Dilution Factor:	1				
% Moisture.....:	21	Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	ND	5.1	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	89	(47 - 142)
n-Octacosane	77	(25 - 162)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

PARSONS Engineering Science, INC.

Client Sample ID: UT-3

GC Semivolatiles

Lot-Sample #...:	D8K200146-014	Work Order #...:	CNMDF103	Matrix.....:	SO
Date Sampled...:	11/19/98 09:30	Date Received..:	11/20/98		
Prep Date.....:	12/02/98	Analysis Date..:	12/16/98		
Prep Batch #...:	8336177	Analysis Time..:	19:48		
Dilution Factor:	1				
% Moisture.....:	20	Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	5.1	5.0	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	84	(47 - 142)
n-Octacosane	93	(25 - 162)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

Sample resembles a hydrocarbon product occurring within the n-alkane range of C10 to C28.

PARSONS Engineering Science, INC.

Client Sample ID: UT-2

GC Semivolatiles

Lot-Sample #...:	D8K200146-015	Work Order #...:	CNMDG103	Matrix.....:	SO
Date Sampled...:	11/19/98 11:10	Date Received..:	11/20/98		
Prep Date.....:	12/02/98	Analysis Date..:	12/16/98		
Prep Batch #...:	8336177	Analysis Time..:	20:26		
Dilution Factor:	1				
% Moisture.....:	12	Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	49	4.5	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	94	(47 - 142)
n-Octacosane	77	(25 - 162)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

Sample resembles a hydrocarbon product occurring within the n-alkane range of C10 to C28.

PARSONS Engineering Science, INC.

Client Sample ID: UT-1

GC Semivolatiles

Lot-Sample #...:	D8K200146-016	Work Order #...:	CNMDK103	Matrix.....:	SO
Date Sampled...:	11/19/98 12:05	Date Received..:	11/20/98		
Prep Date.....:	12/02/98	Analysis Date..:	12/16/98		
Prep Batch #...:	8336177	Analysis Time..:	21:04		
Dilution Factor:	1				
% Moisture.....:	4.8	Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	52	4.2	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	93	(47 - 142)
n-Octacosane	63	(25 - 162)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

Sample resembles a hydrocarbon product occurring within the n-alkane range of C10 to C28.

Quanterra Incorporated
4955 Yarrow Street
Arvada, Colorado 80002

303 421-6611 Telephone
303 431-7171 Fax

ANALYTICAL REPORT

Eaker AFB

Lot #: D8K210160

Doug Downey

Parsons Engineering Services

QUANTERRA INCORPORATED

Ellen La Riviere
Project Manager

December 21, 1998

Project Narrative
(D8K210160)

Sample Receipt

The following discrepancies were noted by the laboratory upon receipt of the samples:

The chain of custody listed the client identification for sample D8K210160-013 as DT-4-GW, but the sample labels were labeled DT-1-GW. The client instructed the laboratory to log the sample as DT-1-GW.

For sample DT-1-GW, TPH-GRO and BTEX were not requested on the chain of custody, but bottles were received for these analyses. The client instructed the laboratory to perform these analyses.

Polynuclear Aromatic Hydrocarbons were requested for sample D8K210160-011, but bottles were not received for this analysis.

HPLC Organic Explosives

The Method 8310 surrogates were diluted to less than detectable concentrations in samples D8K210160-012 and –013. Likewise, the matrix spike and surrogate compounds were diluted out of the MS/MSD performed on sample –013. These samples were diluted due to elevated concentrations of target compounds.

GC Volatile BTEX

The pH of sample D8K210160-011 was recorded at the time of analysis as pH 7. According to the AFCEE QAPP, samples for Method 8020 analysis should be preserved with HCl to a pH of < 2 or be analyzed within seven days. Because the chain of custody indicated this sample was preserved, a holding time of 14 days was implemented.

The Method 8020 surrogates were diluted out of sample –005, the sample was diluted due to elevated concentrations of target compounds.

GC Volatile GRO

The Method 8015-GRO surrogate was diluted out of sample –005, the sample was diluted due to elevated concentrations of target compounds.

The recovery of the surrogate a,a,a-trifluorotoluene, was above the upper control limit in sample –011 due to matrix interference.

GC Semi-Volatile DRO

The Method 8015-DRO surrogates were diluted to less than detectable concentrations in samples D8K210160-001, -012, and –013 due to elevated concentrations of target compounds. Likewise, the matrix spike and surrogate compounds were diluted out of the MS/MSD performed on sample –013.

EXECUTIVE SUMMARY - Detection Highlights

D8K210160

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
P-14 11/19/98 13:10 001				
Diesel Range Organics	78	46	mg/kg	SW846 8015 MOD
Chlorobenzene	0.10	0.0023	mg/kg	SW846 8020A
Chlorobenzene	0.13	0.0023	mg/kg	SW846 8020A
Chlorobenzene	0.13	0.0023	mg/kg	SW846 8020A
Gasoline Range Organics	51 B	1.2	mg/kg	SW846 8015 MOD
Anthracene	0.073 J	0.51	mg/kg	SW846 8310
Anthracene	0.095 J	0.51	mg/kg	SW846 8310
Anthracene	0.095 J	0.51	mg/kg	SW846 8310
Benzo(a)anthracene	0.11	0.010	mg/kg	SW846 8310
Benzo(a)anthracene	0.083	0.010	mg/kg	SW846 8310
Benzo(a)anthracene	0.083	0.010	mg/kg	SW846 8310
Benzo(b)fluoranthene	0.096	0.014	mg/kg	SW846 8310
Benzo(b)fluoranthene	0.071	0.014	mg/kg	SW846 8310
Benzo(b)fluoranthene	0.071	0.014	mg/kg	SW846 8310
Benzo(k)fluoranthene	0.038	0.013	mg/kg	SW846 8310
Benzo(k)fluoranthene	0.032	0.013	mg/kg	SW846 8310
Benzo(k)fluoranthene	0.032	0.013	mg/kg	SW846 8310
Benzo(ghi)perylene	0.030 J	0.058	mg/kg	SW846 8310
Benzo(ghi)perylene	0.047 J	0.058	mg/kg	SW846 8310
Benzo(ghi)perylene	0.047 J	0.058	mg/kg	SW846 8310
Benzo(a)pyrene	0.077	0.017	mg/kg	SW846 8310
Benzo(a)pyrene	0.076	0.017	mg/kg	SW846 8310
Benzo(a)pyrene	0.076	0.017	mg/kg	SW846 8310
Fluoranthene	0.30	0.16	mg/kg	SW846 8310
Fluoranthene	0.32	0.16	mg/kg	SW846 8310
Fluoranthene	0.32	0.16	mg/kg	SW846 8310
Fluorene	0.12 J	0.16	mg/kg	SW846 8310
Fluorene	0.11 J	0.16	mg/kg	SW846 8310
Fluorene	0.11 J	0.16	mg/kg	SW846 8310
Indeno(1,2,3-cd)pyrene	0.015 J	0.035	mg/kg	SW846 8310
Indeno(1,2,3-cd)pyrene	0.036	0.035	mg/kg	SW846 8310
Indeno(1,2,3-cd)pyrene	0.036	0.035	mg/kg	SW846 8310
Naphthalene	0.11 J	1.4	mg/kg	SW846 8310
Naphthalene	0.10 J	1.4	mg/kg	SW846 8310
Naphthalene	0.10 J	1.4	mg/kg	SW846 8310
Phenanthrene	0.36 J	0.48	mg/kg	SW846 8310
Phenanthrene	0.37 J	0.48	mg/kg	SW846 8310
Phenanthrene	0.37 J	0.48	mg/kg	SW846 8310
Pyrene	0.19 J	0.21	mg/kg	SW846 8310
Pyrene	0.11 J	0.21	mg/kg	SW846 8310
Pyrene	0.11 J	0.21	mg/kg	SW846 8310
Percent Moisture	13.3	0.10	%	MCAWW 160.3 MOD

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EXECUTIVE SUMMARY - Detection Highlights

D8K210160

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
DT-4 11/19/98 14:15 002				
Gasoline Range Organics	0.55 J,B	1.4	mg/kg	SW846 8015 MOD
Percent Moisture	27.6	0.10	%	MCAWW 160.3 MOD
DT-3 11/19/98 14:55 003				
Diesel Range Organics	75	4.7	mg/kg	SW846 8015 MOD
Chlorobenzene	0.36	0.0058	mg/kg	SW846 8020A
Chlorobenzene	0.54	0.0058	mg/kg	SW846 8020A
Chlorobenzene	0.54	0.0058	mg/kg	SW846 8020A
Gasoline Range Organics	83 B	2.9	mg/kg	SW846 8015 MOD
Anthracene	0.074 J	0.51	mg/kg	SW846 8310
Anthracene	0.098 J	0.51	mg/kg	SW846 8310
Anthracene	0.098 J	0.51	mg/kg	SW846 8310
Benzo(a)anthracene	0.11	0.010	mg/kg	SW846 8310
Benzo(a)anthracene	0.085	0.010	mg/kg	SW846 8310
Benzo(a)anthracene	0.085	0.010	mg/kg	SW846 8310
Benzo(b)fluoranthene	0.094	0.014	mg/kg	SW846 8310
Benzo(b)fluoranthene	0.069	0.014	mg/kg	SW846 8310
Benzo(b)fluoranthene	0.069	0.014	mg/kg	SW846 8310
Benzo(k)fluoranthene	0.037	0.013	mg/kg	SW846 8310
Benzo(k)fluoranthene	0.032	0.013	mg/kg	SW846 8310
Benzo(k)fluoranthene	0.032	0.013	mg/kg	SW846 8310
Benzo(ghi)perylene	0.031 J	0.058	mg/kg	SW846 8310
Benzo(ghi)perylene	0.046 J	0.058	mg/kg	SW846 8310
Benzo(ghi)perylene	0.046 J	0.058	mg/kg	SW846 8310
Benzo(a)pyrene	0.074	0.017	mg/kg	SW846 8310
Benzo(a)pyrene	0.073	0.017	mg/kg	SW846 8310
Benzo(a)pyrene	0.073	0.017	mg/kg	SW846 8310
Fluoranthene	0.31	0.16	mg/kg	SW846 8310
Fluoranthene	0.34	0.16	mg/kg	SW846 8310
Fluoranthene	0.34	0.16	mg/kg	SW846 8310
Fluorene	0.12 J	0.16	mg/kg	SW846 8310
Fluorene	0.11 J	0.16	mg/kg	SW846 8310
Fluorene	0.11 J	0.16	mg/kg	SW846 8310
Indeno(1,2,3-cd)pyrene	0.014 J	0.035	mg/kg	SW846 8310
Indeno(1,2,3-cd)pyrene	0.037	0.035	mg/kg	SW846 8310
Indeno(1,2,3-cd)pyrene	0.037	0.035	mg/kg	SW846 8310
Naphthalene	0.12 J	1.4	mg/kg	SW846 8310
Naphthalene	0.13 J	1.4	mg/kg	SW846 8310
Naphthalene	0.13 J	1.4	mg/kg	SW846 8310
Phenanthrene	0.39 J	0.49	mg/kg	SW846 8310
Phenanthrene	0.38 J	0.49	mg/kg	SW846 8310
Phenanthrene	0.38 J	0.49	mg/kg	SW846 8310

(Continued on next page)

EXECUTIVE SUMMARY - Detection Highlights

D8K210160

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
DT-3 11/19/98 14:55 003				
Pyrene	0.20 J	0.21	mg/kg	SW846 8310
Pyrene	0.11 J	0.21	mg/kg	SW846 8310
Pyrene	0.11 J	0.21	mg/kg	SW846 8310
Percent Moisture	14.0	0.10	%	MCAWW 160.3 MOD
DT-1 11/19/98 15:30 004				
Diesel Range Organics	8.4	4.5	mg/kg	SW846 8015 MOD
Benzene	0.0017	0.0011	mg/kg	SW846 8020A
Benzene	0.0018	0.0011	mg/kg	SW846 8020A
Benzene	0.0018	0.0011	mg/kg	SW846 8020A
Ethylbenzene	0.0014 J	0.0022	mg/kg	SW846 8020A
Ethylbenzene	0.0013 J	0.0022	mg/kg	SW846 8020A
Ethylbenzene	0.0013 J	0.0022	mg/kg	SW846 8020A
Xylenes (total)	0.0012 J	0.0022	mg/kg	SW846 8020A
Xylenes (total)	0.0011 J	0.0022	mg/kg	SW846 8020A
Xylenes (total)	0.0011 J	0.0022	mg/kg	SW846 8020A
Gasoline Range Organics	1.8 B	1.1	mg/kg	SW846 8015 MOD
Anthracene	0.0037 J	0.49	mg/kg	SW846 8310
Anthracene	0.0044 J	0.49	mg/kg	SW846 8310
Anthracene	0.0044 J	0.49	mg/kg	SW846 8310
Benzo(a)anthracene	0.0099 J	0.010	mg/kg	SW846 8310
Benzo(a)anthracene	0.0058 J	0.010	mg/kg	SW846 8310
Benzo(a)anthracene	0.0058 J	0.010	mg/kg	SW846 8310
Benzo(b)fluoranthene	0.0098 J	0.013	mg/kg	SW846 8310
Benzo(b)fluoranthene	0.0071 J	0.013	mg/kg	SW846 8310
Benzo(b)fluoranthene	0.0071 J	0.013	mg/kg	SW846 8310
Benzo(a)pyrene	0.0063 J	0.017	mg/kg	SW846 8310
Benzo(a)pyrene	0.0072 J	0.017	mg/kg	SW846 8310
Benzo(a)pyrene	0.0072 J	0.017	mg/kg	SW846 8310
Fluoranthene	0.019 J	0.16	mg/kg	SW846 8310
Fluoranthene	0.020 J	0.16	mg/kg	SW846 8310
Fluoranthene	0.020 J	0.16	mg/kg	SW846 8310
Fluorene	0.015 J	0.16	mg/kg	SW846 8310
Fluorene	0.0095 J	0.16	mg/kg	SW846 8310
Fluorene	0.0095 J	0.16	mg/kg	SW846 8310
Phenanthrene	0.024 J	0.47	mg/kg	SW846 8310
Phenanthrene	0.020 J	0.47	mg/kg	SW846 8310
Phenanthrene	0.020 J	0.47	mg/kg	SW846 8310
Pyrene	0.014 J	0.20	mg/kg	SW846 8310
Pyrene	0.012 J	0.20	mg/kg	SW846 8310
Pyrene	0.012 J	0.20	mg/kg	SW846 8310
Percent Moisture	10.6	0.10	%	MCAWW 160.3 MOD

(Continued on next page)

EXECUTIVE SUMMARY - Detection Highlights

D8K210160

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
DT-2 11/19/98 16:20 005				
Diesel Range Organics	11	4.5	mg/kg	SW846 8015 MOD
Ethylbenzene	2.3	0.011	mg/kg	SW846 8020A
Ethylbenzene	2.4	0.011	mg/kg	SW846 8020A
Ethylbenzene	2.4	0.011	mg/kg	SW846 8020A
Xylenes (total)	2.8	0.011	mg/kg	SW846 8020A
Xylenes (total)	1.5	0.011	mg/kg	SW846 8020A
Xylenes (total)	1.5	0.011	mg/kg	SW846 8020A
Gasoline Range Organics	100 B	5.6	mg/kg	SW846 8015 MOD
Anthracene	0.0058 J	0.49	mg/kg	SW846 8310
Anthracene	0.0072 J	0.49	mg/kg	SW846 8310
Anthracene	0.0072 J	0.49	mg/kg	SW846 8310
Benzo(a)anthracene	0.018	0.010	mg/kg	SW846 8310
Benzo(a)anthracene	0.011	0.010	mg/kg	SW846 8310
Benzo(a)anthracene	0.011	0.010	mg/kg	SW846 8310
Benzo(b)fluoranthene	0.021	0.013	mg/kg	SW846 8310
Benzo(b)fluoranthene	0.016	0.013	mg/kg	SW846 8310
Benzo(b)fluoranthene	0.016	0.013	mg/kg	SW846 8310
Benzo(k)fluoranthene	0.0075 J	0.012	mg/kg	SW846 8310
Benzo(k)fluoranthene	0.0066 J	0.012	mg/kg	SW846 8310
Benzo(k)fluoranthene	0.0066 J	0.012	mg/kg	SW846 8310
Benzo(a)pyrene	0.014 J	0.017	mg/kg	SW846 8310
Benzo(a)pyrene	0.015 J	0.017	mg/kg	SW846 8310
Benzo(a)pyrene	0.015 J	0.017	mg/kg	SW846 8310
Fluoranthene	0.036 J	0.16	mg/kg	SW846 8310
Fluoranthene	0.043 J	0.16	mg/kg	SW846 8310
Fluoranthene	0.043 J	0.16	mg/kg	SW846 8310
Fluorene	0.012 J	0.16	mg/kg	SW846 8310
Fluorene	0.011 J	0.16	mg/kg	SW846 8310
Fluorene	0.011 J	0.16	mg/kg	SW846 8310
Phenanthrene	0.035 J	0.47	mg/kg	SW846 8310
Phenanthrene	0.029 J	0.47	mg/kg	SW846 8310
Phenanthrene	0.029 J	0.47	mg/kg	SW846 8310
Pyrene	0.028 J	0.20	mg/kg	SW846 8310
Pyrene	0.015 J	0.20	mg/kg	SW846 8310
Pyrene	0.015 J	0.20	mg/kg	SW846 8310
Percent Moisture	11.0	0.10	%	MCAWW 160.3 MOD
P-13 11/19/98 17:05 006				
Diesel Range Organics	5.4	5.4	mg/kg	SW846 8015 MOD
Benzene	0.91	0.0034	mg/kg	SW846 8020A
Benzene	0.91	0.0034	mg/kg	SW846 8020A
Benzene	1.0	0.0034	mg/kg	SW846 8020A

(Continued on next page)

EXECUTIVE SUMMARY - Detection Highlights

D8K210160

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
P-13 11/19/98 17:05 006				
Ethylbenzene	0.92	0.0068	mg/kg	SW846 8020A
Ethylbenzene	0.92	0.0068	mg/kg	SW846 8020A
Ethylbenzene	1.0	0.0068	mg/kg	SW846 8020A
Toluene	0.33	0.0068	mg/kg	SW846 8020A
Toluene	0.33	0.0068	mg/kg	SW846 8020A
Toluene	0.41	0.0068	mg/kg	SW846 8020A
Xylenes (total)	2.7	0.0068	mg/kg	SW846 8020A
Xylenes (total)	2.7	0.0068	mg/kg	SW846 8020A
Xylenes (total)	2.9	0.0068	mg/kg	SW846 8020A
Gasoline Range Organics	61 B	3.4	mg/kg	SW846 8015 MOD
Naphthalene	0.45 J	1.6	mg/kg	SW846 8310
Naphthalene	0.45 J	1.6	mg/kg	SW846 8310
Naphthalene	0.45 J	1.6	mg/kg	SW846 8310
Percent Moisture	26.4	0.10	%	MCAWW 160.3 MOD
RT-4 11/20/98 07:30 007				
Diesel Range Organics	5.8	4.4	mg/kg	SW846 8015 MOD
Benzene	0.0015	0.0011	mg/kg	SW846 8020A
Benzene	0.0015	0.0011	mg/kg	SW846 8020A
Benzene	0.0015	0.0011	mg/kg	SW846 8020A
Ethylbenzene	0.00054 J	0.0022	mg/kg	SW846 8020A
Ethylbenzene	0.00043 J	0.0022	mg/kg	SW846 8020A
Ethylbenzene	0.00043 J	0.0022	mg/kg	SW846 8020A
Xylenes (total)	0.0018 J	0.0022	mg/kg	SW846 8020A
Xylenes (total)	0.0015 J	0.0022	mg/kg	SW846 8020A
Xylenes (total)	0.0015 J	0.0022	mg/kg	SW846 8020A
Gasoline Range Organics	2.8 B	1.1	mg/kg	SW846 8015 MOD
Percent Moisture	9.9	0.10	%	MCAWW 160.3 MOD
RT-3 11/20/98 07:48 008				
Diesel Range Organics	46	4.8	mg/kg	SW846 8015 MOD
Benzene	0.049	0.0012	mg/kg	SW846 8020A
Benzene	0.036	0.0012	mg/kg	SW846 8020A
Benzene	0.036	0.0012	mg/kg	SW846 8020A
Ethylbenzene	0.26	0.0024	mg/kg	SW846 8020A
Ethylbenzene	0.35	0.0024	mg/kg	SW846 8020A
Ethylbenzene	0.35	0.0024	mg/kg	SW846 8020A
Toluene	0.12	0.0024	mg/kg	SW846 8020A
Toluene	0.048	0.0024	mg/kg	SW846 8020A
Toluene	0.048	0.0024	mg/kg	SW846 8020A
Gasoline Range Organics	30 B	1.2	mg/kg	SW846 8015 MOD

(Continued on next page)

EXECUTIVE SUMMARY - Detection Highlights

D8K210160

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
RT-3 11/20/98 07:48 008				
Percent Moisture	16.5	0.10	%	MCAWW 160.3 MOD
RT-2 11/20/98 08:15 009				
Diesel Range Organics	36	4.7	mg/kg	SW846 8015 MOD
Ethylbenzene	0.37	0.0023	mg/kg	SW846 8020A
Ethylbenzene	0.39	0.0023	mg/kg	SW846 8020A
Ethylbenzene	0.39	0.0023	mg/kg	SW846 8020A
Xylenes (total)	0.11	0.0023	mg/kg	SW846 8020A
Xylenes (total)	0.046	0.0023	mg/kg	SW846 8020A
Xylenes (total)	0.046	0.0023	mg/kg	SW846 8020A
Gasoline Range Organics	23 B	1.2	mg/kg	SW846 8015 MOD
Percent Moisture	14.6	0.10	%	MCAWW 160.3 MOD
RT-1 11/20/98 07:10 010				
Gasoline Range Organics	12 B	1.4	mg/kg	SW846 8015 MOD
Percent Moisture	28.1	0.10	%	MCAWW 160.3 MOD
UT-2-GW 11/20/98 11:20 011				
Diesel Range Organics	0.51	0.10	mg/L	SW846 8015 MOD
Toluene	5.5	2.0	ug/L	SW846 8020A
Xylenes (total)	1.8 J	2.0	ug/L	SW846 8020A
Toluene	1.3 J	2.0	ug/L	SW846 8020A
Toluene	1.3 J	2.0	ug/L	SW846 8020A
Xylenes (total)	2.2	2.0	ug/L	SW846 8020A
Xylenes (total)	2.2	2.0	ug/L	SW846 8020A
Gasoline Range Organics	500 B	100	ug/L	SW846 8015 MOD
RT-3-GW 11/20/98 09:15 012				
Diesel Range Organics	3.5	2.0	mg/L	SW846 8015 MOD
Benzene	2200	200	ug/L	SW846 8020A
Ethylbenzene	2600	200	ug/L	SW846 8020A
Toluene	49 J	200	ug/L	SW846 8020A
Xylenes (total)	190 J	200	ug/L	SW846 8020A
Benzene	2100	200	ug/L	SW846 8020A
Benzene	2100	200	ug/L	SW846 8020A
Ethylbenzene	2400	200	ug/L	SW846 8020A
Ethylbenzene	2400	200	ug/L	SW846 8020A
Toluene	24 J	200	ug/L	SW846 8020A
Toluene	24 J	200	ug/L	SW846 8020A

(Continued on next page)

EXECUTIVE SUMMARY - Detection Highlights

D8K210160

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
RT-3-GW 11/20/98 09:15 012				
Xylenes (total)	190 J	200	ug/L	SW846 8020A
Xylenes (total)	190 J	200	ug/L	SW846 8020A
Gasoline Range Organics	23000 B	10000	ug/L	SW846 8015 MOD
Anthracene	1.6	1.0	ug/L	SW846 8310
Anthracene	1.6	1.0	ug/L	SW846 8310
Anthracene	1.5	1.0	ug/L	SW846 8310
Fluoranthene	3.0	2.0	ug/L	SW846 8310
Fluoranthene	3.0	2.0	ug/L	SW846 8310
Fluoranthene	2.9	2.0	ug/L	SW846 8310
Naphthalene	580	10	ug/L	SW846 8310
Naphthalene	580	10	ug/L	SW846 8310
Naphthalene	620	10	ug/L	SW846 8310
Phenanthrene	11	2.0	ug/L	SW846 8310
Phenanthrene	11	2.0	ug/L	SW846 8310
Phenanthrene	11	2.0	ug/L	SW846 8310
DT-1-GW 11/20/98 09:45 013				
Diesel Range Organics	3.1	2.0	mg/L	SW846 8015 MOD
Benzene	2200	400	ug/L	SW846 8020A
Ethylbenzene	2600	400	ug/L	SW846 8020A
Xylenes (total)	180 J	400	ug/L	SW846 8020A
Benzene	2200	400	ug/L	SW846 8020A
Benzene	2200	400	ug/L	SW846 8020A
Ethylbenzene	2400	400	ug/L	SW846 8020A
Ethylbenzene	2400	400	ug/L	SW846 8020A
Xylenes (total)	180 J	400	ug/L	SW846 8020A
Xylenes (total)	180 J	400	ug/L	SW846 8020A
Gasoline Range Organics	18000 B	10000	ug/L	SW846 8015 MOD
Anthracene	1.3	1.0	ug/L	SW846 8310
Anthracene	1.3	1.0	ug/L	SW846 8310
Anthracene	1.2	1.0	ug/L	SW846 8310
Fluoranthene	2.4	2.0	ug/L	SW846 8310
Fluoranthene	2.4	2.0	ug/L	SW846 8310
Fluoranthene	2.1	2.0	ug/L	SW846 8310
Naphthalene	500	10	ug/L	SW846 8310
Naphthalene	500	10	ug/L	SW846 8310
Naphthalene	550	10	ug/L	SW846 8310
Phenanthrene	9.6	2.0	ug/L	SW846 8310
Phenanthrene	9.6	2.0	ug/L	SW846 8310
Phenanthrene	9.0	2.0	ug/L	SW846 8310

ANALYTICAL METHODS SUMMARY

D8K210160

PARAMETER	ANALYTICAL METHOD
Aromatic Volatile Organics by GC	SW846 8020A
Extractable Petroleum Hydrocarbons	SW846 8015 MOD
Percent Moisture	MCAWW 160.3 MOD
Polynuclear Aromatic Hydrocarbons by HPLC	SW846 8310
Volatile Petroleum Hydrocarbons	SW846 8015 MOD

References:

MCAWW "Methods for Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983 and subsequent revisions.

SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

SAMPLE SUMMARY

D8K210160

WO #	SAMPLE#	CLIENT SAMPLE ID	DATE	TIME
CNNX1	001	P-14	11/19/98	13:10
CNNX3	002	DT-4	11/19/98	14:15
CNNX4	003	DT-3	11/19/98	14:55
CNNX5	004	DT-1	11/19/98	15:30
CNNX6	005	DT-2	11/19/98	16:20
CNNX7	006	P-13	11/19/98	17:05
CNNX8	007	RT-4	11/20/98	07:30
CNNX9	008	RT-3	11/20/98	07:48
CNNXA	009	RT-2	11/20/98	08:15
CNNXC	010	RT-1	11/20/98	07:10
CNNXD	011	UT-2-GW	11/20/98	11:20
CNNXE	012	RT-3-GW	11/20/98	09:15
CNNXG	013	DT-1-GW	11/20/98	09:45
CNNXK	014	TRIP BLANK	11/20/98	

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.

Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

PARSONS Engineering Science, INC.

Client Sample ID: P-14

HPLC

Lot-Sample #...:	D8K210160-001	Work Order #...:	CNNX1104	Matrix.....:	SOLID
Date Sampled...:	11/19/98 13:10	Date Received..:	11/21/98		
Prep Date.....:	11/23/98	Analysis Date..:	12/01/98		
Prep Batch #...:	8327214	Analysis Time..:	09:59		
Dilution Factor:	1				
% Moisture.....:	13	Method.....:	SW846 8310		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Acenaphthene	ND	1.4	mg/kg
Acenaphthylene	ND	1.8	mg/kg
Anthracene	**0.095 J**	**0.51**	**mg/kg**
Benzo(a)anthracene	**0.083**	**0.010**	**mg/kg**
Benzo(b)fluoranthene	**0.071**	**0.014**	**mg/kg**
Benzo(k)fluoranthene	**0.032**	**0.013**	**mg/kg**
Benzo(ghi)perylene	**0.047 J**	**0.058**	**mg/kg**
Benzo(a)pyrene	**0.076**	**0.017**	**mg/kg**
Chrysene	ND	0.12	mg/kg
Fluoranthene	**0.32**	**0.16**	**mg/kg**
Fluorene	**0.11 J**	**0.16**	**mg/kg**
Indeno(1,2,3-cd)pyrene	**0.036**	**0.035**	**mg/kg**
Naphthalene	**0.10 J**	**1.4**	**mg/kg**
Phenanthrene	**0.37 J**	**0.48**	**mg/kg**
Pyrene	**0.11 J**	**0.21**	**mg/kg**
Dibenzo(a,h)anthracene	ND	0.023	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Terphenyl-d14	89	(22 - 167)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

1C

PARSONS Engineering Science, INC.

Client Sample ID: P-14

HPLC

Lot-Sample #...: D8K210160-001 Work Order #...: CNNX1106 Matrix.....: SOLID
Date Sampled...: 11/19/98 13:10 Date Received..: 11/21/98
Prep Date.....: 11/23/98 Analysis Date..: 12/01/98
Prep Batch #...: 8327214 Analysis Time..: 09:59
Dilution Factor: 1
% Moisture.....: 13 Method.....: SW846 8310

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Acenaphthene	ND	1.4	mg/kg
Acenaphthylene	ND	1.8	mg/kg
Anthracene	0.073 J	0.51	mg/kg
Benzo(a)anthracene	0.11	0.010	mg/kg
Benzo(b)fluoranthene	0.096	0.014	mg/kg
Benzo(k)fluoranthene	0.038	0.013	mg/kg
Benzo(ghi)perylene	0.030 J	0.058	mg/kg
Benzo(a)pyrene	0.077	0.017	mg/kg
Chrysene	ND	0.12	mg/kg
Fluoranthene	0.30	0.16	mg/kg
Fluorene	0.12 J	0.16	mg/kg
Indeno(1,2,3-cd)pyrene	0.015 J	0.035	mg/kg
Naphthalene	0.11 J	1.4	mg/kg
Phenanthrene	0.36 J	0.48	mg/kg
[illegible]rene	0.19 J	0.21	mg/kg
[illegible]enzo(a,h)anthracene	ND	0.023	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Terphenyl-d14	100	(22 - 167)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

2C

PARSONS Engineering Science, INC.

Client Sample ID: DT-4

HPLC

Lot-Sample #...:	D8K210160-002	**Work Order #...:**	CNNX3104	**Matrix.....:**	SOLID
Date Sampled...:	11/19/98 14:15	**Date Received..:**	11/21/98		
Prep Date.....:	11/23/98	**Analysis Date..:**	12/01/98		
Prep Batch #...:	8327214	**Analysis Time..:**	10:29		
Dilution Factor:	1				
% Moisture.....:	28	**Method.....:**	SW846 8310		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Acenaphthene	ND	1.7	mg/kg
Acenaphthylene	ND	2.1	mg/kg
Anthracene	ND	0.61	mg/kg
Benzo(a)anthracene	ND	0.012	mg/kg
Benzo(b)fluoranthene	ND	0.017	mg/kg
Benzo(k)fluoranthene	ND	0.015	mg/kg
Benzo(ghi)perylene	ND	0.069	mg/kg
Benzo(a)pyrene	ND	0.021	mg/kg
Chrysene	ND	0.14	mg/kg
Fluoranthene	ND	0.19	mg/kg
Fluorene	ND	0.19	mg/kg
Indeno(1,2,3-cd)pyrene	ND	0.041	mg/kg
Naphthalene	ND	1.7	mg/kg
Phenanthrene	ND	0.58	mg/kg
Pyrene	ND	0.25	mg/kg
Dibenzo(a,h)anthracene	ND	0.028	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Terphenyl-d14	83	(22 - 167)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

PARSONS Engineering Science, INC.

Client Sample ID: DT-3

HPLC

Lot-Sample #...: D8K210160-003 Work Order #...: CNNX4104 Matrix.....: SOLID
Date Sampled...: 11/19/98 14:55 Date Received..: 11/21/98
Prep Date.....: 11/23/98 Analysis Date..: 12/01/98
Prep Batch #...: 8327214 Analysis Time..: 10:59
Dilution Factor: 1
% Moisture.....: 14 Method.....: SW846 8310

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Acenaphthene	ND	1.4	mg/kg
Acenaphthylene	ND	1.8	mg/kg
Anthracene	**0.098 J**	**0.51**	**mg/kg**
Benzo(a)anthracene	**0.085**	**0.010**	**mg/kg**
Benzo(b)fluoranthene	**0.069**	**0.014**	**mg/kg**
Benzo(k)fluoranthene	**0.032**	**0.013**	**mg/kg**
Benzo(ghi)perylene	**0.046 J**	**0.058**	**mg/kg**
Benzo(a)pyrene	**0.073**	**0.017**	**mg/kg**
Chrysene	ND	0.12	mg/kg
Fluoranthene	**0.34**	**0.16**	**mg/kg**
Fluorene	**0.11 J**	**0.16**	**mg/kg**
Indeno(1,2,3-cd)pyrene	**0.037**	**0.035**	**mg/kg**
Naphthalene	**0.13 J**	**1.4**	**mg/kg**
Phenanthrene	**0.38 J**	**0.49**	**mg/kg**
Pyrene	**0.11 J**	**0.21**	**mg/kg**
Dibenzo(a,h)anthracene	ND	0.023	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Terphenyl-d14	87	(22 - 167)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

1C

PARSONS Engineering Science, INC.

Client Sample ID: DT-3

HPLC

Lot-Sample #...:	D8K210160-003	**Work Order #...:**	CNNX4106	**Matrix.....:**	SOLID
Date Sampled...:	11/19/98 14:55	**Date Received..:**	11/21/98		
Prep Date.....:	11/23/98	**Analysis Date..:**	12/01/98		
Prep Batch #...:	8327214	**Analysis Time..:**	10:59		
Dilution Factor:	1				
% Moisture.....:	14	**Method.....:**	SW846 8310		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Acenaphthene	ND	1.4	mg/kg
Acenaphthylene	ND	1.8	mg/kg
Anthracene	**0.074 J**	**0.51**	**mg/kg**
Benzo(a)anthracene	**0.11**	**0.010**	**mg/kg**
Benzo(b)fluoranthene	**0.094**	**0.014**	**mg/kg**
Benzo(k)fluoranthene	**0.037**	**0.013**	**mg/kg**
Benzo(ghi)perylene	**0.031 J**	**0.058**	**mg/kg**
Benzo(a)pyrene	**0.074**	**0.017**	**mg/kg**
Chrysene	ND	0.12	mg/kg
Fluoranthene	**0.31**	**0.16**	**mg/kg**
Fluorene	**0.12 J**	**0.16**	**mg/kg**
Indeno(1,2,3-cd)pyrene	**0.014 J**	**0.035**	**mg/kg**
Naphthalene	**0.12 J**	**1.4**	**mg/kg**
Phenanthrene	**0.39 J**	**0.49**	**mg/kg**
Pyrene	**0.20 J**	**0.21**	**mg/kg**
Dibenzo(a,h)anthracene	ND	0.023	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Terphenyl-d14	99	(22 - 167)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

2C

PARSONS Engineering Science, INC.

Client Sample ID: DT-1

HPLC

Lot-Sample #...:	D8K210160-004	Work Order #...:	CNNX5104	Matrix.....:	SOLID
Date Sampled...:	11/19/98 15:30	Date Received..:	11/21/98		
Prep Date.....:	11/23/98	Analysis Date..:	12/01/98		
Prep Batch #...:	8327214	Analysis Time..:	11:29		
Dilution Factor:	1				
% Moisture.....:	11	Method.....:	SW846 8310		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Acenaphthene	ND	1.3	mg/kg
Acenaphthylene	ND	1.7	mg/kg
Anthracene	**0.0044 J**	**0.49**	**mg/kg**
Benzo(a)anthracene	**0.0058 J**	**0.010**	**mg/kg**
Benzo(b)fluoranthene	**0.0071 J**	**0.013**	**mg/kg**
Benzo(k)fluoranthene	ND	0.012	mg/kg
Benzo(ghi)perylene	ND	0.056	mg/kg
Benzo(a)pyrene	**0.0072 J**	**0.017**	**mg/kg**
Chrysene	ND	0.11	mg/kg
Fluoranthene	**0.020 J**	**0.16**	**mg/kg**
Fluorene	**0.0095 J**	**0.16**	**mg/kg**
Indeno(1,2,3-cd)pyrene	ND	0.034	mg/kg
Naphthalene	ND	1.3	mg/kg
Phenanthrene	**0.020 J**	**0.47**	**mg/kg**
Pyrene	**0.012 J**	**0.20**	**mg/kg**
Dibenzo(a,h)anthracene	ND	0.022	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Terphenyl-d14	89	(22 - 167)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

1C

PARSONS Engineering Science, INC.

Client Sample ID: DT-1

HPLC

Lot-Sample #...:	D8K210160-004	**Work Order #...:**	CNNX510J	**Matrix.....:**	SOLID
Date Sampled...:	11/19/98 15:30	**Date Received..:**	11/21/98		
Prep Date.....:	11/23/98	**Analysis Date..:**	12/01/98		
Prep Batch #...:	8327214	**Analysis Time..:**	11:29		
Dilution Factor:	1				
% Moisture.....:	11	**Method.....:**	SW846 8310		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Acenaphthene	ND	1.3	mg/kg
Acenaphthylene	ND	1.7	mg/kg
Anthracene	**0.0037 J**	**0.49**	**mg/kg**
Benzo(a)anthracene	**0.0099 J**	**0.010**	**mg/kg**
Benzo(b)fluoranthene	**0.0098 J**	**0.013**	**mg/kg**
Benzo(k)fluoranthene	ND	0.012	mg/kg
Benzo(ghi)perylene	ND	0.056	mg/kg
Benzo(a)pyrene	**0.0063 J**	**0.017**	**mg/kg**
Chrysene	ND	0.11	mg/kg
Fluoranthene	**0.019 J**	**0.16**	**mg/kg**
Fluorene	**0.015 J**	**0.16**	**mg/kg**
Indeno(1,2,3-cd)pyrene	ND	0.034	mg/kg
Naphthalene	ND	1.3	mg/kg
Phenanthrene	**0.024 J**	**0.47**	**mg/kg**
Pyrene	**0.014 J**	**0.20**	**mg/kg**
Dibenzo(a,h)anthracene	ND	0.022	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Terphenyl-d14	90	(22 - 167)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

2C

PARSONS Engineering Science, INC.

Client Sample ID: DT-2

HPLC

Lot-Sample #...:	D8K210160-005	Work Order #...:	CNNX6104	Matrix.....:	SOLID
Date Sampled...:	11/19/98 16:20	Date Received..:	11/21/98		
Prep Date.....:	11/23/98	Analysis Date..:	12/01/98		
Prep Batch #...:	8327214	Analysis Time..:	12:58		
Dilution Factor:	1				
% Moisture.....:	11	Method.....:	SW846 8310		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Acenaphthene	ND	1.3	mg/kg
Acenaphthylene	ND	1.7	mg/kg
Anthracene	**0.0072 J**	**0.49**	**mg/kg**
Benzo(a)anthracene	**0.011**	**0.010**	**mg/kg**
Benzo(b)fluoranthene	**0.016**	**0.013**	**mg/kg**
Benzo(k)fluoranthene	**0.0066 J**	**0.012**	**mg/kg**
Benzo(ghi)perylene	ND	0.056	mg/kg
Benzo(a)pyrene	**0.015 J**	**0.017**	**mg/kg**
Chrysene	ND	0.11	mg/kg
Fluoranthene	**0.043 J**	**0.16**	**mg/kg**
Fluorene	**0.011 J**	**0.16**	**mg/kg**
Indeno(1,2,3-cd)pyrene	ND	0.034	mg/kg
Naphthalene	ND	1.3	mg/kg
Phenanthrene	**0.029 J**	**0.47**	**mg/kg**
Pyrene	**0.015 J**	**0.20**	**mg/kg**
[redacted]enzo(a,h)anthracene	ND	0.022	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Terphenyl-d14	98	(22 - 167)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

1C

PARSONS Engineering Science, INC.

Client Sample ID: DT-2

HPLC

Lot-Sample #...:	D8K210160-005	**Work Order #...:**	CNNX6106	**Matrix.....:**	SOLID
Date Sampled...:	11/19/98 16:20	**Date Received..:**	11/21/98		
Prep Date.....:	11/23/98	**Analysis Date..:**	12/01/98		
Prep Batch #...:	8327214	**Analysis Time..:**	12:58		
Dilution Factor:	1				
% Moisture.....:	11	**Method.....:**	SW846 8310		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Acenaphthene	ND	1.3	mg/kg
Acenaphthylene	ND	1.7	mg/kg
Anthracene	**0.0058 J**	**0.49**	**mg/kg**
Benzo(a)anthracene	**0.018**	**0.010**	**mg/kg**
Benzo(b)fluoranthene	**0.021**	**0.013**	**mg/kg**
Benzo(k)fluoranthene	**0.0075 J**	**0.012**	**mg/kg**
Benzo(ghi)perylene	ND	0.056	mg/kg
Benzo(a)pyrene	**0.014 J**	**0.017**	**mg/kg**
Chrysene	ND	0.11	mg/kg
Fluoranthene	**0.036 J**	**0.16**	**mg/kg**
Fluorene	**0.012 J**	**0.16**	**mg/kg**
Indeno(1,2,3-cd)pyrene	ND	0.034	mg/kg
Naphthalene	ND	1.3	mg/kg
Phenanthrene	**0.035 J**	**0.47**	**mg/kg**
Pyrene	**0.028 J**	**0.20**	**mg/kg**
Dibenzo(a,h)anthracene	ND	0.022	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Terphenyl-d14	101	(22 - 167)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

2C

PARSONS Engineering Science, INC.

Client Sample ID: P-13

HPLC

Lot-Sample #...: D8K210160-006 Work Order #...: CNNX7104 Matrix.....: SOLID
Date Sampled...: 11/19/98 17:05 Date Received..: 11/21/98
Prep Date.....: 11/23/98 Analysis Date..: 12/01/98
Prep Batch #...: 8327214 Analysis Time..: 13:28
Dilution Factor: 1
% Moisture.....: 26 Method.....: SW846 8310

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Acenaphthene	ND	1.6	mg/kg
Acenaphthylene	ND	2.1	mg/kg
Anthracene	ND	0.60	mg/kg
Benzo(a)anthracene	ND	0.012	mg/kg
Benzo(b)fluoranthene	ND	0.016	mg/kg
Benzo(k)fluoranthene	ND	0.015	mg/kg
Benzo(ghi)perylene	ND	0.068	mg/kg
Benzo(a)pyrene	ND	0.020	mg/kg
Chrysene	ND	0.14	mg/kg
Fluoranthene	ND	0.19	mg/kg
Fluorene	ND	0.19	mg/kg
Indeno(1,2,3-cd)pyrene	ND	0.041	mg/kg
Naphthalene	**0.45 J**	**1.6**	**mg/kg**
Phenanthrene	ND	0.57	mg/kg
Pyrene	ND	0.24	mg/kg
Benzo(a,h)anthracene	ND	0.027	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Terphenyl-d14	83	(22 - 167)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

1C

PARSONS Engineering Science, INC.

Client Sample ID: P-13

HPLC

Lot-Sample #...:	D8K210160-006	**Work Order #...:**	CNNX7106	**Matrix.....:**	SOLID
Date Sampled...:	11/19/98 17:05	**Date Received..:**	11/21/98		
Prep Date.....:	11/23/98	**Analysis Date..:**	12/01/98		
Prep Batch #...:	8327214	**Analysis Time..:**	13:28		
Dilution Factor:	1				
% Moisture.....:	26	**Method.....:**	SW846 8310		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Acenaphthene	ND	1.6	mg/kg
Acenaphthylene	ND	2.1	mg/kg
Anthracene	ND	0.60	mg/kg
Benzo(a)anthracene	ND	0.012	mg/kg
Benzo(b)fluoranthene	ND	0.016	mg/kg
Benzo(k)fluoranthene	ND	0.015	mg/kg
Benzo(ghi)perylene	ND	0.068	mg/kg
Benzo(a)pyrene	ND	0.020	mg/kg
Chrysene	ND	0.14	mg/kg
Fluoranthene	ND	0.19	mg/kg
Fluorene	ND	0.19	mg/kg
Indeno(1,2,3-cd)pyrene	ND	0.041	mg/kg
Naphthalene	**0.45 J**	**1.6**	**mg/kg**
Phenanthrene	ND	0.57	mg/kg
Pyrene	ND	0.24	mg/kg
Dibenzo(a,h)anthracene	ND	0.027	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Terphenyl-d14	84	(22 - 167)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

2C

PARSONS Engineering Science, INC.

Client Sample ID: RT-3-GW

HPLC

Lot-Sample #...: D8K210160-012 Work Order #...: CNNXE101 Matrix.....: WATER
Date Sampled...: 11/20/98 09:15 Date Received..: 11/21/98
Prep Date.....: 11/23/98 Analysis Date..: 12/08/98
Prep Batch #...: 8327301 Analysis Time..: 14:30
Dilution Factor: 10
Method.....: SW846 8310

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Acenaphthene	ND	10	ug/L
Acenaphthylene	ND	10	ug/L
Anthracene	**1.6**	**1.0**	**ug/L**
Benzo(a)anthracene	ND	1.3	ug/L
Benzo(a)pyrene	ND	2.3	ug/L
Benzo(b)fluoranthene	ND	1.8	ug/L
Benzo(ghi)perylene	ND	2.0	ug/L
Benzo(k)fluoranthene	ND	1.7	ug/L
Chrysene	ND	2.0	ug/L
Dibenzo(a,h)anthracene	ND	3.0	ug/L
Fluoranthene	**3.0**	**2.0**	**ug/L**
Fluorene	ND	2.0	ug/L
Indeno(1,2,3-cd)pyrene	ND	4.3	ug/L
Naphthalene	**580**	**10**	**ug/L**
Phenanthrene	**11**	**2.0**	**ug/L**
[illegible]ene	ND	2.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Terphenyl-d14	0.0 DIL,*	(25 - 157)

NOTE(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

* Surrogate recovery is outside stated control limits.

1C

PARSONS Engineering Science, INC.

Client Sample ID: RT-3-GW

HPLC

Lot-Sample #...: D8K210160-012 **Work Order #...:** CNNXE106 **Matrix.....:** WATER
Date Sampled...: 11/20/98 09:15 **Date Received..:** 11/21/98
Prep Date.....: 11/23/98 **Analysis Date..:** 12/08/98
Prep Batch #...: 8327301 **Analysis Time..:** 14:30
Dilution Factor: 10

Method.....: SW846 8310

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Acenaphthene	ND	10	ug/L
Acenaphthylene	ND	10	ug/L
Anthracene	**1.5**	**1.0**	**ug/L**
Benzo(a)anthracene	ND	1.3	ug/L
Benzo(a)pyrene	ND	2.3	ug/L
Benzo(b)fluoranthene	ND	1.8	ug/L
Benzo(ghi)perylene	ND	2.0	ug/L
Benzo(k)fluoranthene	ND	1.7	ug/L
Chrysene	ND	2.0	ug/L
Dibenzo(a,h)anthracene	ND	3.0	ug/L
Fluoranthene	**2.9**	**2.0**	**ug/L**
Fluorene	ND	2.0	ug/L
Indeno(1,2,3-cd)pyrene	ND	4.3	ug/L
Naphthalene	**620**	**10**	**ug/L**
Phenanthrene	**11**	**2.0**	**ug/L**
Pyrene	ND	2.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Terphenyl-d14	0.0 DIL,*	(25 - 157)

NOTE(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

* Surrogate recovery is outside stated control limits.

2C

PARSONS Engineering Science, INC.

Client Sample ID: DT-1-GW

HPLC

Lot-Sample #...: D8K210160-013 Work Order #...: CNNXG10H Matrix.....: WATER
Date Sampled...: 11/20/98 09:45 Date Received..: 11/21/98
Prep Date.....: 11/23/98 Analysis Date..: 12/08/98
Prep Batch #...: 8327301 Analysis Time..: 15:00
Dilution Factor: 10

Method.....: SW846 8310

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Acenaphthene	ND	10	ug/L
Acenaphthylene	ND	10	ug/L
Anthracene	**1.2**	**1.0**	**ug/L**
Benzo(a)anthracene	ND	1.3	ug/L
Benzo(a)pyrene	ND	2.3	ug/L
Benzo(b)fluoranthene	ND	1.8	ug/L
Benzo(ghi)perylene	ND	2.0	ug/L
Benzo(k)fluoranthene	ND	1.7	ug/L
Chrysene	ND	2.0	ug/L
Dibenzo(a,h)anthracene	ND	3.0	ug/L
Fluoranthene	**2.1**	**2.0**	**ug/L**
Fluorene	ND	2.0	ug/L
Indeno(1,2,3-cd)pyrene	ND	4.3	ug/L
Naphthalene	**550**	**10**	**ug/L**
Phenanthrene	**9.0**	**2.0**	**ug/L**
Pyrene	ND	2.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Terphenyl-d14	0.0 DIL,*	(25 - 157)

NOTE(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

* Surrogate recovery is outside stated control limits.

2C

PARSONS Engineering Science, INC.

Client Sample ID: DT-1-GW

HPLC

Lot-Sample #...: D8K210160-013 **Work Order #...:** CNNXG101 **Matrix.....:** WATER
Date Sampled...: 11/20/98 09:45 **Date Received..:** 11/21/98
Prep Date.....: 11/23/98 **Analysis Date..:** 12/08/98
Prep Batch #...: 8327301 **Analysis Time..:** 15:00
Dilution Factor: 10

Method.....: SW846 8310

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Acenaphthene	ND	10	ug/L
Acenaphthylene	ND	10	ug/L
Anthracene	**1.3**	**1.0**	**ug/L**
Benzo(a)anthracene	ND	1.3	ug/L
Benzo(a)pyrene	ND	2.3	ug/L
Benzo(b)fluoranthene	ND	1.8	ug/L
Benzo(ghi)perylene	ND	2.0	ug/L
Benzo(k)fluoranthene	ND	1.7	ug/L
Chrysene	ND	2.0	ug/L
Dibenzo(a,h)anthracene	ND	3.0	ug/L
Fluoranthene	**2.4**	**2.0**	**ug/L**
Fluorene	ND	2.0	ug/L
Indeno(1,2,3-cd)pyrene	ND	4.3	ug/L
Naphthalene	**500**	**10**	**ug/L**
Phenanthrene	**9.6**	**2.0**	**ug/L**
Pyrene	ND	2.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Terphenyl-d14	0.0 DIL,*	(25 - 157)

NOTE(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

* Surrogate recovery is outside stated control limits.

1C

PARSONS Engineering Science, INC.

Client Sample ID: P-14

GC Volatiles

Lot-Sample #...:	D8K210160-001	Work Order #...:	CNNX1105	Matrix.....:	SOLID
Date Sampled...:	11/19/98 13:10	Date Received..:	11/21/98		
Prep Date.....:	12/02/98	Analysis Date..:	12/02/98		
Prep Batch #...:	8337229	Analysis Time..:	12:52		
Dilution Factor:	1				
% Moisture.....:	13	Method.....:	SW846 8020A		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	ND	0.0012	mg/kg
Chlorobenzene	**0.13**	**0.0023**	**mg/kg**
1,2-Dichlorobenzene	ND	0.0046	mg/kg
1,3-Dichlorobenzene	ND	0.0046	mg/kg
1,4-Dichlorobenzene	ND	0.0035	mg/kg
Ethylbenzene	ND	0.0023	mg/kg
Toluene	ND	0.0023	mg/kg
Xylenes (total)	ND	0.0023	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	85	(34 - 175)
Fluorobenzene	73	(34 - 175)

NOTE(S):

s and reporting limits have been adjusted for dry weight.

PARSONS Engineering Science, INC.

Client Sample ID: P-14

GC Volatiles

Lot-Sample #...:	D8K210160-001	**Work Order #...:**	CNNX110D	**Matrix.....:**	SOLID
Date Sampled...:	11/19/98 13:10	**Date Received..:**	11/21/98		
Prep Date.....:	12/02/98	**Analysis Date..:**	12/02/98		
Prep Batch #...:	8337229	**Analysis Time..:**	12:52		
Dilution Factor:	1				
% Moisture.....:	13	**Method.....:**	SW846 8020A		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	ND	0.0012	mg/kg
Chlorobenzene	**0.10**	**0.0023**	**mg/kg**
1,2-Dichlorobenzene	ND	0.0046	mg/kg
1,3-Dichlorobenzene	ND	0.0046	mg/kg
1,4-Dichlorobenzene	ND	0.0035	mg/kg
Ethylbenzene	ND	0.0023	mg/kg
Toluene	ND	0.0023	mg/kg
Xylenes (total)	ND	0.0023	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	87	(34 - 175)
Fluorobenzene	79	(34 - 175)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

2C

PARSONS Engineering Science, INC.

Client Sample ID: DT-4

GC Volatiles

Lot-Sample #...: D8K210160-002 Work Order #...: CNNX3105 Matrix.....: SOLID
Date Sampled...: 11/19/98 14:15 Date Received..: 11/21/98
Prep Date.....: 11/25/98 Analysis Date..: 11/25/98
Prep Batch #...: 8335165 Analysis Time..: 11:47
Dilution Factor: 1
% Moisture.....: 28 Method.....: SW846 8020A

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	ND	0.0014	mg/kg
Chlorobenzene	ND	0.0028	mg/kg
1,2-Dichlorobenzene	ND	0.0055	mg/kg
1,3-Dichlorobenzene	ND	0.0055	mg/kg
1,4-Dichlorobenzene	ND	0.0041	mg/kg
Ethylbenzene	ND	0.0028	mg/kg
Toluene	ND	0.0028	mg/kg
Xylenes (total)	ND	0.0028	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	100	(34 - 175)
Fluorobenzene	95	(34 - 175)

NOTE(S):

ts and reporting limits have been adjusted for dry weight.

PARSONS Engineering Science, INC.

Client Sample ID: DT-3

GC Volatiles

Lot-Sample #...:	D8K210160-003	**Work Order #...:**	CNNX4105	**Matrix.....:**	SOLID
Date Sampled...:	11/19/98 14:55	**Date Received..:**	11/21/98		
Prep Date.....:	12/02/98	**Analysis Date..:**	12/02/98		
Prep Batch #...:	8337229	**Analysis Time..:**	14:39		
Dilution Factor:	2.5				
% Moisture.....:	14	**Method.....:**	SW846 8020A		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	ND	0.0029	mg/kg
Chlorobenzene	**0.54**	**0.0058**	**mg/kg**
1,2-Dichlorobenzene	ND	0.012	mg/kg
1,3-Dichlorobenzene	ND	0.012	mg/kg
1,4-Dichlorobenzene	ND	0.0087	mg/kg
Ethylbenzene	ND	0.0058	mg/kg
Toluene	ND	0.0058	mg/kg
Xylenes (total)	ND	0.0058	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	92	(34 - 175)
Fluorobenzene	75	(34 - 175)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

1C

PARSONS Engineering Science, INC.

Client Sample ID: DT-3

GC Volatiles

Lot-Sample #...: D8K210160-003 Work Order #...: CNNX4107 Matrix.....: SOLID
Date Sampled...: 11/19/98 14:55 Date Received..: 11/21/98
Prep Date.....: 12/02/98 Analysis Date..: 12/02/98
Prep Batch #...: 8337229 Analysis Time..: 14:39
Dilution Factor: 2.5
% Moisture.....: 14 Method.....: SW846 8020A

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	ND	0.0029	mg/kg
Chlorobenzene	**0.36**	**0.0058**	**mg/kg**
1,2-Dichlorobenzene	ND	0.012	mg/kg
1,3-Dichlorobenzene	ND	0.012	mg/kg
1,4-Dichlorobenzene	ND	0.0087	mg/kg
Ethylbenzene	ND	0.0058	mg/kg
Toluene	ND	0.0058	mg/kg
Xylenes (total)	ND	0.0058	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	81	(34 - 175)
Fluorobenzene	81	(34 - 175)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

PARSONS Engineering Science, INC.

Client Sample ID: DT-1

GC Volatiles

Lot-Sample #...:	D8K210160-004	**Work Order #...:**	CNNX5105	**Matrix.....:**	SOLID
Date Sampled...:	11/19/98 15:30	**Date Received..:**	11/21/98		
Prep Date.....:	11/25/98	**Analysis Date..:**	11/25/98		
Prep Batch #...:	8335165	**Analysis Time..:**	17:18		
Dilution Factor:	1				
% Moisture.....:	11	**Method.....:**	SW846 8020A		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	**0.0018**	**0.0011**	**mg/kg**
Chlorobenzene	ND	0.0022	mg/kg
1,2-Dichlorobenzene	ND	0.0045	mg/kg
1,3-Dichlorobenzene	ND	0.0045	mg/kg
1,4-Dichlorobenzene	ND	0.0034	mg/kg
Ethylbenzene	**0.0013 J**	**0.0022**	**mg/kg**
Toluene	ND	0.0022	mg/kg
Xylenes (total)	**0.0011 J**	**0.0022**	**mg/kg**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	97	(34 - 175)
Fluorobenzene	98	(34 - 175)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

1C

PARSONS Engineering Science, INC.

Client Sample ID: DT-1

GC Volatiles

[redacted]ot-Sample #...: D8K210160-004 Work Order #...: CNNX510H Matrix.....: SOLID
Date Sampled...: 11/19/98 15:30 Date Received..: 11/21/98
Prep Date.....: 11/25/98 Analysis Date..: 11/25/98
Prep Batch #...: 8335165 Analysis Time..: 17:18
Dilution Factor: 1
% Moisture.....: 11 Method.....: SW846 8020A

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	**0.0017**	**0.0011**	**mg/kg**
Chlorobenzene	ND	0.0022	mg/kg
1,2-Dichlorobenzene	ND	0.0045	mg/kg
1,3-Dichlorobenzene	ND	0.0045	mg/kg
1,4-Dichlorobenzene	ND	0.0034	mg/kg
Ethylbenzene	**0.0014 J**	**0.0022**	**mg/kg**
Toluene	ND	0.0022	mg/kg
Xylenes (total)	**0.0012 J**	**0.0022**	**mg/kg**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	99	(34 - 175)
Fluorobenzene	101	(34 - 175)

NOTE(S):

[redacted]lts and reporting limits have been adjusted for dry weight.

[redacted]timated result. Result is less than RL.

ZC

PARSONS Engineering Science, INC.

Client Sample ID: DT-2

GC Volatiles

Lot-Sample #...:	D8K210160-005	**Work Order #...:**	CNNX6105	**Matrix.....:**	SOLID
Date Sampled...:	11/19/98 16:20	**Date Received..:**	11/21/98		
Prep Date.....:	12/02/98	**Analysis Date..:**	12/02/98		
Prep Batch #...:	8337229	**Analysis Time..:**	15:14		
Dilution Factor:	5				
% Moisture.....:	11	**Method.....:**	SW846 8020A		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	ND	0.0056	mg/kg
Chlorobenzene	ND	0.011	mg/kg
1,2-Dichlorobenzene	ND	0.022	mg/kg
1,3-Dichlorobenzene	ND	0.022	mg/kg
1,4-Dichlorobenzene	ND	0.017	mg/kg
Ethylbenzene	**2.4**	**0.011**	**mg/kg**
Toluene	ND	0.011	mg/kg
Xylenes (total)	**1.5**	**0.011**	**mg/kg**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	0.0 DIL,*	(34 - 175)
Fluorobenzene	0.0 DIL,*	(34 - 175)

NOTE(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

* Surrogate recovery is outside stated control limits.

Results and reporting limits have been adjusted for dry weight.

1C

PARSONS Engineering Science, INC.

Client Sample ID: DT-2

GC Volatiles

Lab-Sample #...:	D8K210160-005	Work Order #...:	CNNX6107	Matrix.....:	SOLID
Date Sampled...:	11/19/98 16:20	Date Received..:	11/21/98		
Prep Date.....:	12/02/98	Analysis Date..:	12/02/98		
Prep Batch #...:	8337229	Analysis Time..:	15:14		
Dilution Factor:	5				
% Moisture.....:	11	Method.....:	SW846 8020A		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	ND	0.0056	mg/kg
Chlorobenzene	ND	0.011	mg/kg
1,2-Dichlorobenzene	ND	0.022	mg/kg
1,3-Dichlorobenzene	ND	0.022	mg/kg
1,4-Dichlorobenzene	ND	0.017	mg/kg
Ethylbenzene	**2.3**	**0.011**	**mg/kg**
Toluene	ND	0.011	mg/kg
Xylenes (total)	**2.8**	**0.011**	**mg/kg**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	0.0 DIL,*	(34 - 175)
Fluorobenzene	0.0 DIL,*	(34 - 175)

NOTE(S):

The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

Surrogate recovery is outside stated control limits.

Results and reporting limits have been adjusted for dry weight.

2C

PARSONS Engineering Science, INC.

Client Sample ID: P-13

GC Volatiles

Lot-Sample #...:	D8K210160-006	**Work Order #...:**	CNNX7105	**Matrix.....:**	SOLID
Date Sampled...:	11/19/98 17:05	**Date Received..:**	11/21/98		
Prep Date.....:	12/02/98	**Analysis Date..:**	12/02/98		
Prep Batch #...:	8337229	**Analysis Time..:**	15:50		
Dilution Factor:	2.5				
% Moisture.....:	26	**Method.....:**	SW846 8020A		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	**0.91**	**0.0034**	**mg/kg**
Chlorobenzene	ND	0.0068	mg/kg
1,2-Dichlorobenzene	ND	0.014	mg/kg
1,3-Dichlorobenzene	ND	0.014	mg/kg
1,4-Dichlorobenzene	ND	0.010	mg/kg
Ethylbenzene	**0.92**	**0.0068**	**mg/kg**
Toluene	**0.33**	**0.0068**	**mg/kg**
Xylenes (total)	**2.7**	**0.0068**	**mg/kg**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	81	(34 - 175)
Fluorobenzene	73	(34 - 175)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

1C

PARSONS Engineering Science, INC.

Client Sample ID: P-13

GC Volatiles

Lot-Sample #...:	D8K210160-006	Work Order #...: CNNX7107	Matrix.....: SOLID
Date Sampled...:	11/19/98 17:05	Date Received..: 11/21/98	
Prep Date.....:	12/02/98	Analysis Date..: 12/02/98	
Prep Batch #...:	8337229	Analysis Time..: 15:50	
Dilution Factor:	2.5		
% Moisture.....:	26	Method.....: SW846 8020A	

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	**1.0**	**0.0034**	**mg/kg**
Chlorobenzene	ND	0.0068	mg/kg
1,2-Dichlorobenzene	ND	0.014	mg/kg
1,3-Dichlorobenzene	ND	0.014	mg/kg
1,4-Dichlorobenzene	ND	0.010	mg/kg
Ethylbenzene	**1.0**	**0.0068**	**mg/kg**
Toluene	**0.41**	**0.0068**	**mg/kg**
Xylenes (total)	**2.9**	**0.0068**	**mg/kg**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	81	(34 - 175)
Fluorobenzene	78	(34 - 175)

NOTE(S):

s and reporting limits have been adjusted for dry weight.

PARSONS Engineering Science, INC.

Client Sample ID: RT-4

GC Volatiles

Lot-Sample #...:	D8K210160-007	**Work Order #...:**	CNNX8104	**Matrix.....:**	SOLID
Date Sampled...:	11/20/98 07:30	**Date Received..:**	11/21/98		
Prep Date.....:	11/25/98	**Analysis Date..:**	11/25/98		
Prep Batch #...:	8335165	**Analysis Time..:**	14:10		
Dilution Factor:	1				
% Moisture.....:	9.9	**Method.....:**	SW846 8020A		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	**0.0015**	**0.0011**	**mg/kg**
Chlorobenzene	ND	0.0022	mg/kg
1,2-Dichlorobenzene	ND	0.0044	mg/kg
1,3-Dichlorobenzene	ND	0.0044	mg/kg
1,4-Dichlorobenzene	ND	0.0033	mg/kg
Ethylbenzene	**0.00043 J**	**0.0022**	**mg/kg**
Toluene	ND	0.0022	mg/kg
Xylenes (total)	**0.0015 J**	**0.0022**	**mg/kg**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	98	(34 - 175)
Fluorobenzene	96	(34 - 175)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

1C

PARSONS Engineering Science, INC.

Client Sample ID: RT-4

GC Volatiles

Lab-Sample #...:	D8K210160-007	**Work Order #...:**	CNNX8105	**Matrix.....:** SOLID
Date Sampled...:	11/20/98 07:30	**Date Received..:**	11/21/98	
Prep Date.....:	11/25/98	**Analysis Date..:**	11/25/98	
Prep Batch #...:	8335165	**Analysis Time..:**	14:10	
Dilution Factor:	1			
% Moisture.....:	9.9	**Method.....:**	SW846 8020A	

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	**0.0015**	**0.0011**	**mg/kg**
Chlorobenzene	ND	0.0022	mg/kg
1,2-Dichlorobenzene	ND	0.0044	mg/kg
1,3-Dichlorobenzene	ND	0.0044	mg/kg
1,4-Dichlorobenzene	ND	0.0033	mg/kg
Ethylbenzene	**0.00054 J**	**0.0022**	**mg/kg**
Toluene	ND	0.0022	mg/kg
Xylenes (total)	**0.0018 J**	**0.0022**	**mg/kg**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	101	(34 - 175)
Fluorobenzene	102	(34 - 175)

NOTE(S):

lts and reporting limits have been adjusted for dry weight.

timated result. Result is less than RL.

PARSONS Engineering Science, INC.

Client Sample ID: RT-3

GC Volatiles

Lot-Sample #...:	D8K210160-008	**Work Order #...:**	CNNX9104	**Matrix.....:**	SOLID
Date Sampled...:	11/20/98 07:48	**Date Received..:**	11/21/98		
Prep Date.....:	12/02/98	**Analysis Date..:**	12/02/98		
Prep Batch #...:	8337229	**Analysis Time..:**	16:26		
Dilution Factor:	1				
% Moisture.....:	16	**Method.....:**	SW846 8020A		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	**0.036**	**0.0012**	**mg/kg**
Chlorobenzene	ND	0.0024	mg/kg
1,2-Dichlorobenzene	ND	0.0048	mg/kg
1,3-Dichlorobenzene	ND	0.0048	mg/kg
1,4-Dichlorobenzene	ND	0.0036	mg/kg
Ethylbenzene	**0.35**	**0.0024**	**mg/kg**
Toluene	**0.048**	**0.0024**	**mg/kg**
Xylenes (total)	ND	0.0024	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	101	(34 - 175)
Fluorobenzene	79	(34 - 175)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

1C

PARSONS Engineering Science, INC.

Client Sample ID: RT-3

GC Volatiles

Client-Sample #...:	D8K210160-008	Work Order #...:	CNNX9105	Matrix.....: SOLID
Date Sampled...:	11/20/98 07:48	Date Received..:	11/21/98	
Prep Date.....:	12/02/98	Analysis Date..:	12/02/98	
Prep Batch #...:	8337229	Analysis Time..:	16:26	
Dilution Factor:	1			
% Moisture.....:	16	Method.....:	SW846 8020A	

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	**0.049**	**0.0012**	**mg/kg**
Chlorobenzene	ND	0.0024	mg/kg
1,2-Dichlorobenzene	ND	0.0048	mg/kg
1,3-Dichlorobenzene	ND	0.0048	mg/kg
1,4-Dichlorobenzene	ND	0.0036	mg/kg
Ethylbenzene	**0.26**	**0.0024**	**mg/kg**
Toluene	**0.12**	**0.0024**	**mg/kg**
Xylenes (total)	ND	0.0024	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	89	(34 - 175)
Fluorobenzene	85	(34 - 175)

NOTE(S):

s and reporting limits have been adjusted for dry weight.

PARSONS Engineering Science, INC.

Client Sample ID: RT-2

GC Volatiles

Lot-Sample #...:	D8K210160-009	**Work Order #...:**	CNNXA105	**Matrix.....:**	SOLID
Date Sampled...:	11/20/98 08:15	**Date Received..:**	11/21/98		
Prep Date.....:	12/02/98	**Analysis Date..:**	12/02/98		
Prep Batch #...:	8337229	**Analysis Time..:**	17:37		
Dilution Factor:	1				
% Moisture.....:	15	**Method.....:**	SW846 8020A		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	ND	0.0012	mg/kg
Chlorobenzene	ND	0.0023	mg/kg
1,2-Dichlorobenzene	ND	0.0047	mg/kg
1,3-Dichlorobenzene	ND	0.0047	mg/kg
1,4-Dichlorobenzene	ND	0.0035	mg/kg
Ethylbenzene	**0.39**	**0.0023**	**mg/kg**
Toluene	ND	0.0023	mg/kg
Xylenes (total)	**0.046**	**0.0023**	**mg/kg**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	88	(34 - 175)
Fluorobenzene	79	(34 - 175)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

1C

PARSONS Engineering Science, INC.

Client Sample ID: RT-2

GC Volatiles

Lot-Sample #...:	D8K210160-009	Work Order #...:	CNNXA106	Matrix.....:	SOLID
Date Sampled...:	11/20/98 08:15	Date Received..:	11/21/98		
Prep Date.....:	12/02/98	Analysis Date..:	12/02/98		
Prep Batch #...:	8337229	Analysis Time..:	17:37		
Dilution Factor:	1				
% Moisture.....:	15	Method.....:	SW846 8020A		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	ND	0.0012	mg/kg
Chlorobenzene	ND	0.0023	mg/kg
1,2-Dichlorobenzene	ND	0.0047	mg/kg
1,3-Dichlorobenzene	ND	0.0047	mg/kg
1,4-Dichlorobenzene	ND	0.0035	mg/kg
Ethylbenzene	**0.37**	**0.0023**	**mg/kg**
Toluene	ND	0.0023	mg/kg
Xylenes (total)	**0.11**	**0.0023**	**mg/kg**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	88	(34 - 175)
Fluorobenzene	83	(34 - 175)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

PARSONS Engineering Science, INC.

Client Sample ID: RT-1

GC Volatiles

Lot-Sample #...:	D8K210160-010	**Work Order #...:**	CNNXC104	**Matrix.....:**	SOLID
Date Sampled...:	11/20/98 07:10	**Date Received..:**	11/21/98		
Prep Date.....:	11/25/98	**Analysis Date..:**	11/25/98		
Prep Batch #...:	8335165	**Analysis Time..:**	14:46		
Dilution Factor:	1				
% Moisture.....:	28	**Method.....:**	SW846 8020A		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	ND	0.0014	mg/kg
Chlorobenzene	ND	0.0028	mg/kg
1,2-Dichlorobenzene	ND	0.0056	mg/kg
1,3-Dichlorobenzene	ND	0.0056	mg/kg
1,4-Dichlorobenzene	ND	0.0042	mg/kg
Ethylbenzene	ND	0.0028	mg/kg
Toluene	ND	0.0028	mg/kg
Xylenes (total)	ND	0.0028	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	101	(34 - 175)
Fluorobenzene	98	(34 - 175)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

PARSONS Engineering Science, INC.

Client Sample ID: UT-2-GW

GC Volatiles

Lot-Sample #...: D8K210160-011 Work Order #...: CNNXD103 Matrix.....: WATER
Date Sampled...: 11/20/98 11:20 Date Received..: 11/21/98
Prep Date.....: 11/30/98 Analysis Date..: 11/30/98
Prep Batch #...: 8335309 Analysis Time..: 17:04
Dilution Factor: 1

Method.....: SW846 8020A

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	ND	2.0	ug/L
Chlorobenzene	ND	2.0	ug/L
1,2-Dichlorobenzene	ND	4.0	ug/L
1,3-Dichlorobenzene	ND	4.0	ug/L
1,4-Dichlorobenzene	ND	3.0	ug/L
Ethylbenzene	ND	2.0	ug/L
Toluene	**1.3 J**	**2.0**	**ug/L**
Xylenes (total)	**2.2**	**2.0**	**ug/L**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	117	(44 - 165)
Fluorobenzene	111	(44 - 165)

NOTE(S):

J estimated result. Result is less than RL.

PARSONS Engineering Science, INC.

Client Sample ID: UT-2-GW

GC Volatiles

Lot-Sample #...: D8K210160-011 Work Order #...: CNNXD106 Matrix.....: WATER
Date Sampled...: 11/20/98 11:20 Date Received..: 11/21/98
Prep Date.....: 11/30/98 Analysis Date..: 11/30/98
Prep Batch #...: 8335309 Analysis Time..: 17:04
Dilution Factor: 1
Method.....: SW846 8020A

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	ND	2.0	ug/L
Chlorobenzene	ND	2.0	ug/L
1,2-Dichlorobenzene	ND	4.0	ug/L
1,3-Dichlorobenzene	ND	4.0	ug/L
1,4-Dichlorobenzene	ND	3.0	ug/L
Ethylbenzene	ND	2.0	ug/L
Toluene	**5.5**	**2.0**	**ug/L**
Xylenes (total)	**1.8 J**	**2.0**	**ug/L**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	92	(44 - 165)
Fluorobenzene	101	(44 - 165)

NOTE(S):

J Estimated result. Result is less than RL.

2C

PARSONS Engineering Science, INC.

Client Sample ID: RT-3-GW

GC Volatiles

Lot-Sample #...: D8K210160-012 Work Order #...: CNNXE102 Matrix.....: WATER
Date Sampled...: 11/20/98 09:15 Date Received..: 11/21/98
Prep Date.....: 11/30/98 Analysis Date..: 11/30/98
Prep Batch #...: 8335309 Analysis Time..: 17:40
Dilution Factor: 100 Method.....: SW846 8020A

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	**2100**	**200**	**ug/L**
Chlorobenzene	ND	200	ug/L
1,2-Dichlorobenzene	ND	400	ug/L
1,3-Dichlorobenzene	ND	400	ug/L
1,4-Dichlorobenzene	ND	300	ug/L
Ethylbenzene	**2400**	**200**	**ug/L**
Toluene	**24 J**	**200**	**ug/L**
Xylenes (total)	**190 J**	**200**	**ug/L**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	96	(44 - 165)
Fluorobenzene	94	(44 - 165)

NOTE(S):

J Estimated result. Result is less than RL.

PARSONS Engineering Science, INC.

Client Sample ID: RT-3-GW

GC Volatiles

Lot-Sample #...: D8K210160-012 Work Order #...: CNNXE105 Matrix.....: WATER
Date Sampled...: 11/20/98 09:15 Date Received..: 11/21/98
Prep Date.....: 11/30/98 Analysis Date..: 11/30/98
Prep Batch #...: 8335309 Analysis Time..: 17:40
Dilution Factor: 100
Method.....: SW846 8020A

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	**2200**	**200**	**ug/L**
Chlorobenzene	ND	200	ug/L
1,2-Dichlorobenzene	ND	400	ug/L
1,3-Dichlorobenzene	ND	400	ug/L
1,4-Dichlorobenzene	ND	300	ug/L
Ethylbenzene	**2600**	**200**	**ug/L**
Toluene	**49 J**	**200**	**ug/L**
Xylenes (total)	**190 J**	**200**	**ug/L**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	97	(44 - 165)
Fluorobenzene	96	(44 - 165)

NOTE(S):

J Estimated result. Result is less than RL.

2C

PARSONS Engineering Science, INC.

Client Sample ID: DT-1-GW

GC Volatiles

Lot-Sample #...: D8K210160-013 Work Order #...: CNNXG102 Matrix.....: WATER
Date Sampled...: 11/20/98 09:45 Date Received..: 11/21/98
Prep Date.....: 11/30/98 Analysis Date..: 11/30/98
Prep Batch #...: 8335309 Analysis Time..: 18:15
Dilution Factor: 200
Method.....: SW846 8020A

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	**2200**	**400**	**ug/L**
Chlorobenzene	ND	400	ug/L
1,2-Dichlorobenzene	ND	800	ug/L
1,3-Dichlorobenzene	ND	800	ug/L
1,4-Dichlorobenzene	ND	600	ug/L
Ethylbenzene	**2400**	**400**	**ug/L**
Toluene	ND	400	ug/L
Xylenes (total)	**180 J**	**400**	**ug/L**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	93	(44 - 165)
Fluorobenzene	95	(44 - 165)

NOTE(S):
J Estimated result. Result is less than RL.

PARSONS Engineering Science, INC.

Client Sample ID: DT-1-GW

GC Volatiles

Lot-Sample #...:	D8K210160-013	**Work Order #...:**	CNNXG10E	**Matrix.....:**	WATER
Date Sampled...:	11/20/98 09:45	**Date Received..:**	11/21/98		
Prep Date.....:	11/30/98	**Analysis Date..:**	11/30/98		
Prep Batch #...:	8335309	**Analysis Time..:**	18:15		
Dilution Factor:	200				
		Method.....:	SW846 8020A		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	**2200**	**400**	**ug/L**
Chlorobenzene	ND	400	ug/L
1,2-Dichlorobenzene	ND	800	ug/L
1,3-Dichlorobenzene	ND	800	ug/L
1,4-Dichlorobenzene	ND	600	ug/L
Ethylbenzene	**2600**	**400**	**ug/L**
Toluene	ND	400	ug/L
Xylenes (total)	**180 J**	**400**	**ug/L**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	96	(44 - 165)
Fluorobenzene	98	(44 - 165)

NOTE(S):

J Estimated result. Result is less than RL.

2C

PARSONS Engineering Science, INC.

Client Sample ID: TRIP BLANK

GC Volatiles

Lot-Sample #...: D8K210160-014 Work Order #...: CNNXK101 Matrix.....: WATER
Date Sampled...: 11/20/98 Date Received..: 11/21/98
Prep Date.....: 11/30/98 Analysis Date..: 11/30/98
Prep Batch #...: 8335309 Analysis Time..: 16:29
Dilution Factor: 1

Method.....: SW846 8020A

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	ND	2.0	ug/L
Chlorobenzene	ND	2.0	ug/L
1,2-Dichlorobenzene	ND	4.0	ug/L
1,3-Dichlorobenzene	ND	4.0	ug/L
1,4-Dichlorobenzene	ND	3.0	ug/L
Ethylbenzene	ND	2.0	ug/L
Toluene	ND	2.0	ug/L
Xylenes (total)	ND	2.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	94	(44 - 165)
Fluorobenzene	93	(44 - 165)

PARSONS Engineering Science, INC.

Client Sample ID: P-14

GC Volatiles

Lot-Sample #...:	D8K210160-001	Work Order #...:	CNNX1103	Matrix.....:	SOLID
Date Sampled...:	11/19/98 13:10	Date Received..:	11/21/98		
Prep Date.....:	11/23/98	Analysis Date..:	11/25/98		
Prep Batch #...:	8335262	Analysis Time..:	16:21		
Dilution Factor:	1				
% Moisture.....:	13	Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	51 B	1.2	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	110	(64 - 148)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

B The analyte was found in the associated blank, as well as in the sample.

PARSONS Engineering Science, INC.

Client Sample ID: DT-1

GC Volatiles

Lot-Sample #...:	D8K210160-004	Work Order #...:	CNNX5103	Matrix.....:	SOLID
Date Sampled...:	11/19/98 15:30	Date Received..:	11/21/98		
Prep Date.....:	11/23/98	Analysis Date..:	11/25/98		
Prep Batch #...:	8335262	Analysis Time..:	19:19		
Dilution Factor:	1				
% Moisture.....:	11	Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	1.8 B	1.1	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	103	(64 - 148)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

B The analyte was found in the associated blank, as well as in the sample.

PARSONS Engineering Science, INC.

Client Sample ID: DT-2

GC Volatiles

Lot-Sample #...:	D8K210160-005	Work Order #...:	CNNX6103
Date Sampled...:	11/19/98 16:20	Date Received..:	11/21/98
Prep Date.....:	11/23/98	Analysis Date..:	11/25/98
Prep Batch #...:	8335262	Analysis Time..:	22:17
Dilution Factor:	5		
% Moisture.....:	11	Method.....:	SW846 8015 MOD

Matrix.....: SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	100 B	5.6	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	0.0 DIL,*	(64 - 148)

NOTE(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

* Surrogate recovery is outside stated control limits.

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

B The analyte was found in the associated blank, as well as in the sample.

PARSONS Engineering Science, INC.

Client Sample ID: P-13

GC Volatiles

Client-Sample #...:	D8K210160-006	Work Order #...:	CNNX7103	Matrix.....:	SOLID
Date Sampled...:	11/19/98 17:05	Date Received..:	11/21/98		
Prep Date.....:	11/23/98	Analysis Date..:	11/25/98		
Prep Batch #...:	8335262	Analysis Time..:	23:02		
Dilution Factor:	2.5				
% Moisture.....:	26	Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	61 B	3.4	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	106	(64 - 148)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics that are similar to weathered gasoline.

B The analyte was found in the associated blank, as well as in the sample.

PARSONS Engineering Science, INC.

Client Sample ID: RT-4

GC Volatiles

Lot-Sample #...:	D8K210160-007	Work Order #...:	CNNX8103	Matrix.....:	SOLID
Date Sampled...:	11/20/98 07:30	Date Received..:	11/21/98		
Prep Date.....:	11/23/98	Analysis Date..:	11/25/98		
Prep Batch #...:	8335262	Analysis Time..:	23:46		
Dilution Factor:	1				
% Moisture.....:	9.9	Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	2.8 B	1.1	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	100	(64 - 148)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

B The analyte was found in the associated blank, as well as in the sample.

PARSONS Engineering Science, INC.

Client Sample ID: RT-3

GC Volatiles

Lot-Sample #...: D8K210160-008 Work Order #...: CNNX9103 Matrix.....: SOLID
Date Sampled...: 11/20/98 07:48 Date Received..: 11/21/98
Prep Date.....: 11/23/98 Analysis Date..: 11/26/98
Prep Batch #...: 8335262 Analysis Time..: 00:31
Dilution Factor: 1
% Moisture.....: 16 Method.....: SW846 8015 MOD

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	30 B	1.2	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	101	(64 - 148)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

B The analyte was found in the associated blank, as well as in the sample.

PARSONS Engineering Science, INC.

Client Sample ID: RT-2

GC Volatiles

Lot-Sample #...:	D8K210160-009	**Work Order #...:**	CNNXA103	**Matrix.....:**	SOLID
Date Sampled...:	11/20/98 08:15	**Date Received..:**	11/21/98		
Prep Date.....:	11/23/98	**Analysis Date..:**	11/26/98		
Prep Batch #...:	8335262	**Analysis Time..:**	01:15		
Dilution Factor:	1				
% Moisture.....:	15	**Method.....:**	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	**23 B**	**1.2**	**mg/kg**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	104	(64 - 148)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

B The analyte was found in the associated blank, as well as in the sample.

PARSONS Engineering Science, INC.

Client Sample ID: RT-1

GC Volatiles

Lab-Sample #...:	D8K210160-010	Work Order #...:	CNNXC103	Matrix.....:	SOLID
Date Sampled...:	11/20/98 07:10	Date Received..:	11/21/98		
Prep Date.....:	11/23/98	Analysis Date..:	11/26/98		
Prep Batch #...:	8335262	Analysis Time..:	02:00		
Dilution Factor:	1				
% Moisture.....:	28	Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	12 B	1.4	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	96	(64 - 148)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

B The analyte was found in the associated blank, as well as in the sample.

PARSONS Engineering Science, INC.

Client Sample ID: UT-2-GW

GC Volatiles

Lot-Sample #...: D8K210160-011 Work Order #...: CNNXD105 Matrix.....: WATER
Date Sampled...: 11/20/98 11:20 Date Received..: 11/21/98
Prep Date.....: 12/02/98 Analysis Date..: 12/02/98
Prep Batch #...: 8338233 Analysis Time..: 20:06
Dilution Factor: 1
Method.....: SW846 8015 MOD

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	500 B	100	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	160 *	(74 - 138)

NOTE(S):

* Surrogate recovery is outside stated control limits.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

B The analyte was found in the associated blank, as well as in the sample.

PARSONS Engineering Science, INC.

Client Sample ID: RT-3-GW

GC Volatiles

Lot-Sample #...: D8K210160-012 Work Order #...: CNNXE104 Matrix.....: WATER
Date Sampled...: 11/20/98 09:15 Date Received..: 11/21/98
Prep Date.....: 12/02/98 Analysis Date..: 12/02/98
Prep Batch #...: 8338233 Analysis Time..: 20:51
Dilution Factor: 100
Method.....: SW846 8015 MOD

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	23000 B	10000	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	107	(74 - 138)

NOTE(S):

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

B The analyte was found in the associated blank, as well as in the sample.

PARSONS Engineering Science, INC.

Client Sample ID: DT-1-GW

GC Volatiles

Lot-Sample #...: D8K210160-013	Work Order #...: CNNXG104	Matrix.....: WATER	
Date Sampled...: 11/20/98 09:45	Date Received..: 11/21/98		
Prep Date.....: 12/02/98	Analysis Date..: 12/02/98		
Prep Batch #...: 8338233	Analysis Time..: 21:36		
Dilution Factor: 100			
	Method.....: SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	18000 B	10000	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	99	(74 - 138)

NOTE(S):

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

B The analyte was found in the associated blank, as well as in the sample.

PARSONS Engineering Science, INC.

Client Sample ID: P-14

GC Semivolatiles

Lot-Sample #...: D8K210160-001 Work Order #...: CNNX1102 Matrix.....: SOLID
Date Sampled...: 11/19/98 13:10 Date Received..: 11/21/98
Prep Date.....: 12/03/98 Analysis Date..: 12/12/98
Prep Batch #...: 8337169 Analysis Time..: 15:36
Dilution Factor: 10
% Moisture.....: 13 Method.....: SW846 8015 MOD

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	78	46	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	0.0 DIL,*	(47 - 142)
n-Octacosane	0.0 DIL,*	(25 - 162)

NOTE(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

* Surrogate recovery is outside stated control limits.

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

Sample resembles a hydrocarbon product occurring within the n-alkane range of C10 to C28.

PARSONS Engineering Science, INC.

Client Sample ID: DT-4

GC Semivolatiles

Lot-Sample #...:	D8K210160-002	**Work Order #...:**	CNNX3102	**Matrix.....:**	SOLID
Date Sampled...:	11/19/98 14:15	**Date Received..:**	11/21/98		
Prep Date.....:	12/03/98	**Analysis Date..:**	12/12/98		
Prep Batch #...:	8337169	**Analysis Time..:**	16:14		
Dilution Factor:	1				
% Moisture.....:	28	**Method.....:**	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	ND	5.5	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	94	(47 - 142)
n-Octacosane	78	(25 - 162)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

PARSONS Engineering Science, INC.

Client Sample ID: DT-3

GC Semivolatiles

Lot-Sample #...: D8K210160-003 Work Order #...: CNNX4102 Matrix.....: SOLID
Date Sampled...: 11/19/98 14:55 Date Received..: 11/21/98
Prep Date.....: 12/03/98 Analysis Date..: 12/12/98
Prep Batch #...: 8337169 Analysis Time..: 16:52
Dilution Factor: 1
% Moisture.....: 14 Method.....: SW846 8015 MOD

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	75	4.7	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	96	(47 - 142)
n-Octacosane	109	(25 - 162)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

Sample resembles a hydrocarbon product occurring within the n-alkane range of C10 to C28.

PARSONS Engineering Science, INC.

Client Sample ID: DT-1

GC Semivolatiles

Lot-Sample #...:	D8K210160-004	**Work Order #...:**	CNNX5102	**Matrix.....:**	SOLID
Date Sampled...:	11/19/98 15:30	**Date Received..:**	11/21/98		
Prep Date.....:	12/03/98	**Analysis Date..:**	12/12/98		
Prep Batch #...:	8337169	**Analysis Time..:**	17:30		
Dilution Factor:	1				
% Moisture.....:	11	**Method.....:**	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	**8.4**	**4.5**	**mg/kg**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	97	(47 - 142)
n-Octacosane	101	(25 - 162)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

Sample resembles a hydrocarbon product occurring within the n-alkane range of C10 to C28.

PARSONS Engineering Science, INC.

Client Sample ID: DT-2

GC Semivolatiles

Lot-Sample #...:	D8K210160-005	Work Order #...:	CNNX6102	Matrix.....:	SOLID
Date Sampled...:	11/19/98 16:20	Date Received..:	11/21/98		
Prep Date.....:	12/03/98	Analysis Date..:	12/12/98		
Prep Batch #...:	8337169	Analysis Time..:	19:24		
Dilution Factor:	1				
% Moisture.....:	11	Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	11	4.5	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	93	(47 - 142)
n-Octacosane	97	(25 - 162)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

Sample resembles a hydrocarbon product occurring within the n-alkane range of C10 to C28.

PARSONS Engineering Science, INC.

Client Sample ID: P-13

GC Semivolatiles

Lot-Sample #...:	D8K210160-006	Work Order #...:	CNNX7102	Matrix.....: SOLID
Date Sampled...:	11/19/98 17:05	Date Received..:	11/21/98	
Prep Date.....:	12/03/98	Analysis Date..:	12/12/98	
Prep Batch #...:	8337169	Analysis Time..:	21:18	
Dilution Factor:	1			
% Moisture.....:	26	Method.....:	SW846 8015 MOD	

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	5.4	5.4	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	88	(47 - 142)
n-Octacosane	78	(25 - 162)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

Sample resembles a hydrocarbon product occurring within the n-alkane range of C10 to C28.

PARSONS Engineering Science, INC.

Client Sample ID: RT-4

GC Semivolatiles

Lot-Sample #...:	D8K210160-007	Work Order #...:	CNNX8102	Matrix.....: SOLID
Date Sampled...:	11/20/98 07:30	Date Received..:	11/21/98	
Prep Date.....:	12/03/98	Analysis Date..:	12/12/98	
Prep Batch #...:	8337169	Analysis Time..:	21:55	
Dilution Factor:	1			
% Moisture.....:	9.9	Method.....:	SW846 8015 MOD	

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	5.8	4.4	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	103	(47 - 142)
n-Octacosane	112	(25 - 162)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

Sample resembles a hydrocarbon product occurring within the n-alkane range of C10 to C28.

PARSONS Engineering Science, INC.

Client Sample ID: RT-3

GC Semivolatiles

Lot-Sample #...:	D8K210160-008	**Work Order #...:**	CNNX9102	**Matrix.....:**	SOLID
Date Sampled...:	11/20/98 07:48	**Date Received..:**	11/21/98		
Prep Date.....:	12/03/98	**Analysis Date..:**	12/16/98		
Prep Batch #...:	8337169	**Analysis Time..:**	10:53		
Dilution Factor:	1				
% Moisture.....:	16	**Method.....:**	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	**46**	**4.8**	**mg/kg**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	97	(47 - 142)
n-Octacosane	100	(25 - 162)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

Sample resembles a hydrocarbon product occurring within the n-alkane range of C10 to C28.

PARSONS Engineering Science, INC.

Client Sample ID: RT-2

GC Semivolatiles

Lot-Sample #...:	D8K210160-009	Work Order #...:	CNNXA102	Matrix.....:	SOLID
Date Sampled...:	11/20/98 08:15	Date Received..:	11/21/98		
Prep Date.....:	12/03/98	Analysis Date..:	12/16/98		
Prep Batch #...:	8337169	Analysis Time..:	11:31		
Dilution Factor:	1				
% Moisture.....:	15	Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	36	4.7	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	87	(47 - 142)
n-Octacosane	84	(25 - 162)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

Sample resembles a hydrocarbon product occurring within the n-alkane range of C10 to C28.

PARSONS Engineering Science, INC.

Client Sample ID: RT-1

GC Semivolatiles

Lot-Sample #...: D8K210160-010	Work Order #...: CNNXC102	Matrix.....: SOLID	
Date Sampled...: 11/20/98 07:10	Date Received..: 11/21/98		
Prep Date.....: 12/03/98	Analysis Date..: 12/12/98		
Prep Batch #...: 8337169	Analysis Time..: 23:49		
Dilution Factor: 1			
% Moisture.....: 28	Method.....: SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	ND	5.6	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	92	(47 - 142)
n-Octacosane	89	(25 - 162)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

PARSONS Engineering Science, INC.

Client Sample ID: UT-2-GW

GC Semivolatiles

Lot-Sample #...: D8K210160-011 Work Order #...: CNNXD104 Matrix.....: WATER
Date Sampled...: 11/20/98 11:20 Date Received..: 11/21/98
Prep Date.....: 11/24/98 Analysis Date..: 12/10/98
Prep Batch #...: 8328144 Analysis Time..: 18:07
Dilution Factor: 1
Method.....: SW846 8015 MOD

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	0.51	0.10	mg/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	79	(57 - 132)
n-Octacosane	60	(26 - 152)

NOTE(S):

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

Sample resembles a hydrocarbon product occurring within the n-alkane range of C10 to C22.

PARSONS Engineering Science, INC.

Client Sample ID: RT-3-GW

GC Semivolatiles

Lot-Sample #...: D8K210160-012	**Work Order #...:** CNNXE103	**Matrix.....:** WATER	
Date Sampled...: 11/20/98 09:15	**Date Received..:** 11/21/98		
Prep Date.....: 11/24/98	**Analysis Date..:** 12/10/98		
Prep Batch #...: 8328144	**Analysis Time..:** 18:45		
Dilution Factor: 20			
	Method.....: SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	**3.5**	**2.0**	**mg/L**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	0.0 DIL,*	(57 - 132)
n-Octacosane	0.0 DIL,*	(26 - 152)

NOTE(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

* Surrogate recovery is outside stated control limits.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

Sample resembles a hydrocarbon product occurring within the n-alkane range of C10 to C22.

PARSONS Engineering Science, INC.

Client Sample ID: DT-1-GW

GC Semivolatiles

Lot-Sample #...: D8K210160-013	Work Order #...: CNNXG103	Matrix.....: WATER	
Date Sampled...: 11/20/98 09:45	Date Received..: 11/21/98		
Prep Date.....: 11/24/98	Analysis Date..: 12/10/98		
Prep Batch #...: 8328144	Analysis Time..: 19:23		
Dilution Factor: 20			
	Method.....: SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	3.1	2.0	mg/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	0.0 DIL,*	(57 - 132)
n-Octacosane	0.0 DIL,*	(26 - 152)

NOTE(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

* Surrogate recovery is outside stated control limits.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

Sample resembles a hydrocarbon product occurring within the n-alkane range of C10 to C22.

PHASE II ANALYTICAL RESULTS

Lyn Fitzgerald, 5/14/99
See data flags handwritten on result forms
JFH

@AIR TOXICS LTD.

AN ENVIRONMENTAL ANALYTICAL LABORATORY

WORK ORDER #: 9904408

Work Order Summary

CLIENT:	Mr. John Hicks Parsons Engineering Science 1700 Broadway, Suite 900 Denver, CO 80290	**BILL TO:** Same	
PHONE:	303-831-8100	**P.O. #**	726876.68410
FAX:	303-831-8208	**PROJECT #**	Eaker Mil Gas Station
DATE RECEIVED:	4/27/99		
DATE COMPLETED:	5/12/99		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.
01A	P-10-2 feet	TO-3	1.0 "Hg
01AA	P-10-2 feet Duplicate	TO-3	1.0 "Hg
02A	P-10-surface	TO-3	1.5 "Hg
03A	P-13	TO-3	1.0 "Hg
04A	LCS	TO-3	NA
05A	Lab Blank	TO-3	NA

CERTIFIED BY: _____
Laboratory Director

DATE: 5/12/99

Certification numbers: CA ELAP - 1149, NY ELAP - 11291, UT ELAP - E-217

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA 95630
(916) 985-1000 • (800) 985-5955 • FAX (916) 985-1020

AIR TOXICS LTD.

SAMPLE NAME : P-10-2 feet (SG-1)

ID#: 9904408-01A

EPA Method TO-3 GC/PID/FID

File Name:	**6050507**	**Date of Collection:**	**4/22/99**
Dil. Factor:	**1040**	**Date of Analysis:**	**5/ 5/99**

Compound	Det. Limit (ppmv)	Det. Limit (uG/L)	Amount (ppmv)	Amount (uG/L)
Benzene	1.0	3.4	20	65
Toluene	1.0	4.0	2.0 J	7.7 J
Ethyl Benzene	1.0	4.6	3.0 J	13 J
Total Xylenes	1.0	4.6	2.4 J	11 J
TPH (C5+ Hydrocarbons) ref. to Gasoline	10	43	2400 B	9900 B
C2-C4 Hydrocarbons ref. to Gasoline	10	19	320	580

B = Compound present in laboratory blank, background subtraction not performed.
J = Estimated value.

Container Type: 1 Liter Summa Canister

Surrogates	% Recovery	Method Limits
Fluorobenzene (PID)	124	50-150
Fluorobenzene (FID)	132	50-150

AIR TOXICS LTD.

SAMPLE NAME : P-10-2 feet Duplicate (SG-1 duplicate)

ID#: 9904408-01AA

EPA Method TO-3 GC/PID/FID

File Name:	**6050511**	**Date of Collection:**	**4/22/99**
Dil. Factor:	**1040**	**Date of Analysis:**	**5/ 5/99**

Compound	Det. Limit (ppmv)	Det. Limit (uG/L)	Amount (ppmv)	Amount (uG/L)
Benzene	1.0	3.4	23	76
Toluene	1.0	4.0	2.5 J	9.7 J
Ethyl Benzene	1.0	4.6	2.6 J	12 J
Total Xylenes	1.0	4.6	1.8 J	8.1 J
TPH (C5+ Hydrocarbons) ref. to Gasoline	10	43	2600 B	11000 B
C2-C4 Hydrocarbons ref. to Gasoline	10	19	350	650

B = Compound present in laboratory blank, background subtraction not performed.
J = Estimated value.

Container Type: 1 Liter Summa Canister

Surrogates	% Recovery	Method Limits
Fluorobenzene (PID)	123	50-150
Fluorobenzene (FID)	130	50-150

AIR TOXICS LTD.

SAMPLE NAME : P-10-surface (SG-2)

ID#: 9904408-02A

EPA Method TO-3 GC/PID/FID

File Name:	**6050508**	**Date of Collection:**	**4/22/99**
Dil. Factor:	**2.13**	**Date of Analysis:**	**5/ 5/99**

Compound	Det. Limit (ppmv)	Det. Limit (uG/L)	Amount (ppmv)	Amount (uG/L)
Benzene	0.0021	0.0069	Not Detected	Not Detected
Toluene	0.0021	0.0082	0.036	0.14
Ethyl Benzene	0.0021	0.0094	0.0053 J	0.023 J
Total Xylenes	0.0021	0.0094	0.022 J	0.10 J
TPH (C5+ Hydrocarbons) ref. to Gasoline	0.021	0.089	1.5 B	6.4 B
C2-C4 Hydrocarbons ref. to Gasoline	0.021	0.039	0.11	0.20

B = Compound present in laboratory blank, background subtraction not performed.
J = Estimated value.

Container Type: 1 Liter Summa Canister

Surrogates	% Recovery	Method Limits
Fluorobenzene (PID)	70	50-150
Fluorobenzene (FID)	108	50-150

AIR TOXICS LTD.

SAMPLE NAME : P-13 (SG-3)

ID#: 9904408-03A

EPA Method TO-3 GC/PID/FID

File Name:	6050510	Date of Collection:	4/22/99
Dil. Factor:	20.9	Date of Analysis:	5/ 5/99

Compound	Det. Limit (ppmv)	Det. Limit (uG/L)	Amount (ppmv)	Amount (uG/L)	
Benzene	0.021	0.068	0.62 M	2.0 M	J
Toluene	0.021	0.080	0.35	1.3	J
Ethyl Benzene	0.021	0.092	0.47	2.0	J
Total Xylenes	0.021	0.092	1.6	7.1	J
TPH (C5+ Hydrocarbons) ref. to Gasoline	0.21	0.87	100 B	420 B	J
C2-C4 Hydrocarbons ref. to Gasoline	0.21	0.38	0.76 J	1.4 J	J

B = Compound present in laboratory blank, background subtraction not performed.

J = Estimated value.

M = Reported value may be biased due to apparent matrix interferences.

Q = Exceeds Quality Control limits, possibly due to matrix effects.

Container Type: 1 Liter Summa Canister

Surrogates	% Recovery	Method Limits
Fluorobenzene (PID)	169 Q	50-150
Fluorobenzene (FID)	223 Q	50-150

AIR TOXICS LTD.

SAMPLE NAME : LCS

ID#: 9904408-04A

EPA Method TO-3 GC/PID/FID

File Name:	**6050504**	**Date of Collection: NA**
Dil. Factor:	**1.00**	**Date of Analysis: 5/ 5/99**

Compound	Det. Limit (ppmv)	Det. Limit (uG/L)	% Recovery
Benzene	0.0010	0.0032	98
Toluene	0.0010	0.0038	90
Ethyl Benzene	0.0010	0.0044	93
Total Xylenes	0.0010	0.0044	80
TPH (C5+ Hydrocarbons) ref. to Gasoline	0.010	0.042	114
C2-C4 Hydrocarbons ref. to Gasoline	0.010	0.018	114

Container Type: NA

Surrogates	% Recovery	Method Limits
Fluorobenzene (PID)	102	50-150
Fluorobenzene (FID)	111	50-150

AIR TOXICS LTD.

SAMPLE NAME : Lab Blank

ID#: 9904408-05A

EPA Method TO-3 GC/PID/FID

File Name:	**6050506**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 5/ 5/99**	

Compound	Det. Limit (ppmv)	Det. Limit (uG/L)	Amount (ppmv)	Amount (uG/L)
Benzene	0.0010	0.0032	Not Detected	Not Detected
Toluene	0.0010	0.0038	Not Detected	Not Detected
Ethyl Benzene	0.0010	0.0044	Not Detected	Not Detected
Total Xylenes	0.0010	0.0044	Not Detected	Not Detected
TPH (C5+ Hydrocarbons) ref. to Gasoline	0.010	0.042	0.041	0.17 XS= 0.85
C2-C4 Hydrocarbons ref. to Gasoline	0.010	0.018	Not Detected	Not Detected

Container Type: NA

Surrogates	% Recovery	Method Limits
Fluorobenzene (PID)	96	50-150
Fluorobenzene (FID)	103	50-150

Air Toxics Limited

Data file : /chem/gc6.i/05May1999.b/6050511b.d
Lab Smp Id: 9904408-01AA Client Smp ID: P-10-2 feet Duplic.
Inj Date : 05-MAY-1999 14:49
Operator : jc Inst ID: gc6.i
Smp Info : 0.5ml,9376; 9904408-01AA ;P-10-2 feet Duplicate
Misc Info : 1.0"Hg > 15 psi, Parsons Engineering Science
Comment :
Method : /chem/gc6.i/05May1999.b/to3f0407.m/to3b1107.m
Meth Date : 10-May-1999 14:09 jcooper Quant Type: ESTD
Cal Date : 17-FEB-1999 23:53 Cal File: 6021723.d
Als bottle: 1
Dil Factor: 1040.00000
Integrator: Falcon Compound Sublist: BTEX.sub
Target Version: 3.40

Concentration Formula: Amt * DF

Co	s	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (PPMV)	CONCENTRATIONS FINAL (PPMV)	
	3 Benzene	10.577	10.580	-0.003	43836	0.02254	23.44	J
	5 Toluene	12.657	12.663	-0.006	5344	0.00244	2.540(aM)	J
	6 Ethyl Benzene	14.353	14.360	-0.007	5155	0.00252	2.616(a)	J
	7 m,p-Xylenes	14.483	14.487	-0.004	4412	0.00176	1.835(a)	J
	8 o-Xylene	Compound Not Detected.						
M	9 Total Xylenes				4412	0.00176	1.835(a)	J
$	4 Fluorobenzene-SURROGATE	10.857	10.850	0.007	140532	0.12552	0.1255	

KR 5/12/99

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
M - Compound response manually integrated.

5/10/99

Air Toxics Limited

RECOVERY REPORT

Client Name: Client SDG: 05May1999
Sample Matrix: GAS Fraction: VOA
Lab Smp Id: 9904408-01AA Client Smp ID: P-10-2 feet Duplic.
Level: LOW Operator: jc
Data Type: GC DATA SampleType: SAMPLE
SpikeList File: Quant Type: ESTD
Sublist File: BTEX.sub
Method File: /chem/gc6.i/05May1999.b/to3f0407.m/to3b1107.m
Misc Info: 1.0"Hg > 15 psi, Parsons Engineering Science

SURROGATE COMPOUND	CONC ADDED PPMV	CONC RECOVERED PPMV	% RECOVERED	LIMITS
$ 4 Fluorobenzene-SURR	0.1020	0.1255	123.06	50-150

ES 5/10/99

Air Toxics Limited

Data file : /var/chem/gc6.i/05May1999.b/6050506b.d
Lab Smp Id: Humid Lab Blank Client Smp ID: Humid Lab blank
Inj Date : 05-MAY-1999 11:21
Operator : jc Inst ID: gc6.i
Smp Info : 250ml,; Humid Lab Blank ;Humid Lab blank
Misc Info :
Comment :
Method : /chem/gc6.i/05May1999.b/to3f0407.m/to3b1107.m
Meth Date : 05-May-1999 11:12 jcooper Quant Type: ESTD
Cal Date : 17-FEB-1999 23:53 Cal File: 6021723.d
Als bottle: 1
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: all.sub
Target Version: 3.40
Processing Host: frodo

Concentration Formula: Amt * DF

	Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (PPMV)	CONCENTRATIONS FINAL (PPMV)
	1 Methyl t-Butyl Ether	Compound Not Detected.					
	11 tba (1006)	Compound Not Detected.					
	3 Benzene	Compound Not Detected.					
$	4 Fluorobenzene-SURROGATE	10.940	10.850	-0.010	109382	0.09770	0.09770
	5 Toluene	Compound Not Detected.					
	6 Ethyl Benzene	Compound Not Detected.					
	7 m,p-Xylenes	Compound Not Detected.					
	8 o-Xylene	Compound Not Detected.					
M	9 Total Xylenes	Compound Not Detected.					

✓ JC
5/5/99

Air Toxics Limited

RECOVERY REPORT

Client Name:
Sample Matrix: GAS
Lab Smp Id: Humid Lab Blank
Level: LOW
Data Type: GC DATA
SpikeList File:
Sublist File: all.sub
Method File: /chem/gc6.i/05May1999.b/to3f0407.m/to3b1107.m
Misc Info:

Client SDG: 05May1999
Fraction: VOA
Client Smp ID: Humid Lab blank
Operator: jc
SampleType: SAMPLE
Quant Type: ESTD

SURROGATE COMPOUND	CONC ADDED PPMV	CONC RECOVERED PPMV	% RECOVERED	LIMITS
$ 4 Fluorobenzene-SURR	0.1020	0.09770	95.78	50-150

5/5/99

Air Toxics Limited

Data file : /var/chem/gc6.i/05May1999.b/6050506.d
Lab Smp Id: Humid Lab Blank Client Smp ID: Humid Lab blank
Inj Date : 05-MAY-1999 11:21
Operator : jc Inst ID: gc6.i
Smp Info : 250ml,; Humid Lab Blank ;Humid Lab blank
Misc Info :
Comment :
Method : /chem/gc6.i/05May1999.b/to3f0407.m
Meth Date : 05-May-1999 11:11 jcooper Quant Type: ESTD
Cal Date : 06-APR-1998 10:57 Cal File: 6040607.d
Als bottle: 1
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: all.sub
Target Version: 3.40
Processing Host: frodo

Concentration Formula: Amt * DF

	Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (PPMV)	CONCENTRATIONS FINAL (PPMV)	
S	1 Fluorobenzene *SURR1107*	10.343	10.867	-0.024	124872	0.10502	0.1050	
S	2 C2+ (to-12BP0407)	5.200-26.000			91037	0.04707	0.04707	
S	3 C2+ (jp40217)	5.200-26.000			91037	0.03451	0.03451(a)	J
S	64 C2Cl2(JP40217)	5.200-20.247			70929	0.02688	0.02688(a)	J
S	4 C2C4 (jp40217)	Compound Not Detected.						
S	5 C5+ (jp40217)	6.100-26.000			87357	0.03311	0.03311(a)	J
S	6 C2+ (jp51209)	5.200-26.000			91037	0.19250	0.1925	
S	7 C2C4 (jp51209)	Compound Not Detected.						
S	8 C5+ (jp51209)	6.100-26.000			87357	0.18479	0.1848	
S	66 C13+ (JP51125)	20.247-26.000			20108	0.93662	0.9366	
S	9 C2+ (gas1028)	5.200-26.000			91037	0.04276	0.04276	
S	10 C2-C4 (gas1028)	Compound Not Detected.						
S	11 C5+ (gas1028)	6.100-26.000			87357	0.04103	0.04103	
S	12 C9+ (gas1028)	12.863-26.000			41552	0.01952	0.01952(a)	J
S	62 stod0330	5.200-26.000			91037	0.04095	0.04095	

6 Flag Samples

JC 5/5/99

QC Flag Legend

a - Target compound detected but, quantitated amount Below Limit Of Quantitation(BLOQ).

Air Toxics Limited

RECOVERY REPORT

Client Name:
Sample Matrix: GAS
Lab Smp Id: Humid Lab Blank
Level: LOW
Data Type: GC DATA
SpikeList File:
Sublist File: all.sub
Method File: /chem/gc6.i/05May1999.b/to3f0407.m
Misc Info:

Client SDG: 05May1999
Fraction: VOA
Client Smp ID: Humid Lab blank
Operator: jc
SampleType: SAMPLE
Quant Type: ESTD

SURROGATE COMPOUND	CONC ADDED PPMV	CONC RECOVERED PPMV	% RECOVERED	LIMITS
$ 1 Fluorobenzene *SUR	0.1020	0.1050	102.96	50-150

✓
TC
5/5/99

Air Toxics Limited

CONTINUING CALIBRATION COMPOUNDS

Instrument ID: gc6.i Injection Date: 05-MAY-1999 08:14
Lab File ID: 6050501b.d Init. Calibration Date(s): 11/07/98 02/17/99
Analysis Type: AIR Init. Calibration Times: 09:10 23:53
Lab Sample ID: BTEX 290-30 STD Method File: /chem/gc6.i/05May1999.b/to3f0407.m/t
Quant Type: ESTD

	COMPOUND	RRF	RF0	MIN RRF	%D	MAX %D	
	1 Methyl t-Butyl Ether	1007972.397	895630.841	0.010	11.1	25.0	
	11 tba (1006)	142263.000	++++	0.010	++++	25.0	<- Not Included
	3 Benzene	1944495.327	1695934.579	0.010	12.8	25.0	
S	4 Fluorobenzene-SURROGATE	1119623.584	900156.863	0.010	19.6	50.0	
	5 Toluene	2188216.322	1817640.187	0.010	16.9	25.0	
	6 Ethyl Benzene	2048998.131	1714742.991	0.010	16.3	25.0	
	7 m,p-Xylenes	2501053.738	2003107.477	0.010	19.9	25.0	
	8 o-Xylene	2174909.346	1759766.355	0.010	19.1	25.0	
M	9 Total Xylenes	2392338.940	1921993.769	0.010	19.7	25.0	

✓ 5/5/99

Air Toxics Limited

Data file : /chem/gc6.i/05May1999.b/6050501b.d
Lab Smp Id: BTEX 290-30 STD Client Smp ID: Method Spike
Inj Date : 05-MAY-1999 08:14
Operator : jc Inst ID: gc6.i
Smp Info : 250ml,;BTEX 290-30 STD ;Method Spike
Misc Info : 1.07 ppmv > 0.0428 ppmv on column
Comment :
Method : /chem/gc6.i/05May1999.b/to3f0407.m/to3b1107.m
Meth Date : 05-May-1999 09:27 jcooper Quant Type: ESTD
Cal Date : 17-FEB-1999 23:53 Cal File: 6021723.d
Als bottle: 1 Continuing Calibration Sample
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: all.sub
Target Version: 3.40

Concentration Formula: Amt * DF

	Compounds	RT	EXP RT	DLT RT	RESPONSE	AMOUNTS CAL-AMT (PPMV)	AMOUNTS ON-COL (PPMV)
	1 Methyl t-Butyl Ether	8.393	8.393	0.000	38333	0.04280	0.03803
	11 tba (1006)	Compound Not Detected.					
	3 Benzene	10.580	10.580	0.000	72586	0.04280	0.03733
$	4 Fluorobenzene-SURROGATE	10.850	10.850	0.000	91916	0.10200	0.08201
	5 Toluene	12.663	12.663	0.000	77795	0.04280	0.03555
	6 Ethyl Benzene	14.360	14.360	0.000	73391	0.04280	0.03582
	7 m,p-Xylenes	14.487	14.487	0.000	171466	0.08560	0.06856
	8 o-Xylene	15.007	15.007	0.000	75318	0.04280	0.03463
M	9 Total Xylenes				246784	0.12840	0.1032

JC 5/5/99

Air Toxics Limited

RECOVERY REPORT

Client Name:
Sample Matrix: GAS
Lab Smp Id: 397-57 2nd S.BTEX
Level: LOW
Data Type: GC DATA
SpikeList File: 397-57.spk
Sublist File: all.sub
Client SDG: 05May1999
Fraction: VOA
Client Smp ID: Method Spike
Operator: jc
SampleType: LCS
Quant Type: ESTD
Method File: /chem/gc6.i/05May1999.b/to3f0407.m/to3b1107.m
Misc Info: 1.00ppmv > .0.40ppmv on column

	SPIKE COMPOUND	CONC ADDED PPMV	CONC RECOVERED PPMV	% RECOVERED	LIMITS
	3 Benzene	0.03900	0.03827	98.13	75-125
	5 Toluene	0.04000	0.03610	90.24	75-125
	6 Ethyl Benzene	0.04000	0.03707	92.69	75-125
	7 m,p-Xylenes	0.08800	0.07156	81.31	75-125
	8 o-Xylene	0.04400	0.03481	79.12	75-125
M	9 Total Xylenes	0.1320	0.1064	80.58	75-125
	1 Methyl t-Butyl Eth	0.04000	0.03921	98.03	75-125

	SURROGATE COMPOUND	CONC ADDED PPMV	CONC RECOVERED PPMV	% RECOVERED	LIMITS
$	4 Fluorobenzene-SURR	0.1020	0.1036	101.62	50-150

✓ 5/5/99

LCS

Air Toxics Limited

Data file : /chem/gc6.i/05May1999.b/6050504b.d
Lab Smp Id: 397-57 2nd S.BTEX Client Smp ID: Method Spike
Inj Date : 05-MAY-1999 10:06
Operator : jc Inst ID: gc6.i
Smp Info : 10ml,;397-57 2nd S.BTEX STD ;Method Spike
Misc Info : 1.00ppmv > .0.40ppmv on column
Comment :
Method : /chem/gc6.i/05May1999.b/to3f0407.m/to3b1107.m
Meth Date : 05-May-1999 11:12 jcooper Quant Type: ESTD
Cal Date : 17-FEB-1999 23:53 Cal File: 6021723.d
Als bottle: 1 QC Sample: LCS
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: all.sub
Target Version: 3.40

Concentration Formula: Amt * DF

	Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (PPMV)	CONCENTRATIONS FINAL (PPMV)
	1 Methyl t-Butyl Ether	8.390	8.393	-0.003	39526	0.03921	0.03921
	11 tba (1006)	Compound Not Detected.					
	3 Benzene	10.577	10.580	-0.003	74416	0.03827	0.03827
S	4 Fluorobenzene-SURROGATE	10.847	10.850	-0.003	116054	0.10365	0.1036
	5 Toluene	12.660	12.663	-0.003	78990	0.03610	0.03610
	6 Ethyl Benzene	14.357	14.360	-0.003	75966	0.03707	0.03707
	7 m,p-Xylenes	14.483	14.487	-0.004	178968	0.07156	0.07156
	8 o-Xylene	15.003	15.007	-0.004	75719	0.03481	0.03481
M	9 Total Xylenes				254687	0.10637	0.1064

✓ JC 5/5/99

Air Toxics Limited

RECOVERY REPORT

Client Name:
Sample Matrix: GAS
Lab Smp Id: 447-71A Gas STD
Level: LOW
Data Type: GC DATA
SpikeList File: 447-71A.spk
Sublist File: all.sub
Client SDG: 05May1999
Fraction: VOA
Client Smp ID: Method Spike
Operator: jc
SampleType: METHSPIKE
Quant Type: ESTD
Method File: /chem/gc6.i/05May1999.b/to3f0407.m
Misc Info: 380 ppmv > 1.52 ppmv on column

SPIKE COMPOUND	CONC ADDED PPMV	CONC RECOVERED PPMV	% RECOVERED	LIMITS
S 9 C2+ (gas1028)	1.520	1.636	107.65	75-125

SURROGATE COMPOUND	CONC ADDED PPMV	CONC RECOVERED PPMV	% RECOVERED	LIMITS
1 Fluorobenzene *SUR	0.1020	0.1170	114.71	50-150

✓ jc 5/5/99

Air Toxics Limited

Data file : /chem/gc6.i/05May1999.b/6050502.d
Lab Smp Id: 447-71A Gas STD Client Smp ID: Method Spike
Inj Date : 05-MAY-1999 08:47
Operator : jc Inst ID: gc6.i
Smp Info : 1.0ml,
Misc Info : 380 ppmv > 1.52 ppmv on column
Comment :
Method : /chem/gc6.i/05May1999.b/to3f0407.m
Meth Date : 05-May-1999 09:26 jcooper Quant Type: ESTD
Cal Date : 06-APR-1998 10:57 Cal File: 6040607.d
Als bottle: 1 QC Sample: METHSPIKE
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: all.sub
Target Version: 3.40

Concentration Formula: Amt * DF

	Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (PPMV)	FINAL (PPMV)
S 1	Fluorobenzene *SURR1107*	10.850	10.867	-0.017	139122	0.11701	0.1170
S 2	C2- (to-12BP0407)	5.200-26.000			3483454	1.80101	1.801
S 3	C2- (jp40217)	5.200-26.000			3483454	1.32034	1.320
S 64	C2C12(JP40217)	5.200-20.247			3343489	1.26729	1.267
S 4	C2C4 (jp40217)	5.200-6.100			79217	0.03003	0.03002(a)
S 5	C5+ (jp40217)	6.100-26.000			3404237	1.29032	1.290
S 6	C2+ (jp51209)	5.200-26.000			3483454	7.36582	7.366
S 7	C2C4 (jp51209)	5.200-6.100			79217	0.16751	0.1675
S 8	C5+ (jp51209)	6.100-26.000			3404237	7.20103	7.201
S 66	C13+ (JP51125)	20.247-26.000			139965	6.51949	6.519
S 9	C2- (gas1028)	5.200-26.000			3483454	1.63625	1.636
S 10	C2-C4 (gas1028)	5.200-6.100			79217	0.03721	0.03721(a)
S 11	C5+ (gas1028)	6.100-26.000			3404237	1.59905	1.599
S 12	C9- (gas1028)	12.363-26.000			1441280	0.67700	0.6770
S 62	std0330	5.200-26.000			3483454	1.56701	1.567

✓ JC
5/5/99

QC Flag Legend

a - Target compound detected but, quantitated amount Below Limit Of Quantitation(BLOQ).

Air Toxics Limited

RECOVERY REPORT

Client Name:
Sample Matrix: GAS
Lab Smp Id: 447-96A Gas 2nd S.
Level: LOW
Data Type: GC DATA
SpikeList File: 447-96A.spk
Sublist File: all.sub
Method File: /chem/gc6.i/05May1999.b/to3f0407.m
Misc Info: 392ppmv > 1.57ppmv on column

Client SDG: 05May1999
Fraction: VOA
Client Smp ID: Method Spike
Operator: jc
SampleType: LCS
Quant Type: ESTD

SPIKE COMPOUND	CONC ADDED PPMV	CONC RECOVERED PPMV	% RECOVERED	LIMITS
S 9 C2+ (gas1028)	1.568	1.782	113.69	75-125

SURROGATE COMPOUND	CONC ADDED PPMV	CONC RECOVERED PPMV	% RECOVERED	LIMITS
1 Fluorobenzene *SUR	0.1020	0.1134	111.17	50-150

5/5 5/5/99

LCS

Air Toxics Limited

Data file : /chem/gc6.i/05May1999.b/6050505.d
Lab Smp Id: 447-96A Gas 2nd S. Client Smp ID: Method Spike
Inj Date : 05-MAY-1999 10:43
Operator : jc Inst ID: gc6.i
Smp Info : 1.0ml,
Misc Info : 392ppmv > 1.57ppmv on column
Comment :
Method : /chem/gc6.i/05May1999.b/to3f0407.m
Meth Date : 05-May-1999 11:11 jcooper Quant Type: ESTD
Cal Date : 06-APR-1998 10:57 Cal File: 6040607.d
Als bottle: 1 QC Sample: LCS
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: all.sub
Target Version: 3.40

Concentration Formula: Amt * DF

Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (PPMV)	FINAL (PPMV)
S 1 Fluorobenzene *SURR1107*	10.853	10.867	-0.014	134825	0.11339	0.1134
S 2 C2+ (to-12BP0407)	5.200-26.000			3794988	1.96208	1.962
S 3 C2+ (jp40217)	5.200-26.000			3794988	1.43843	1.438
S 64 C2C12 JP40217)	5.200-20.247			3596834	1.36332	1.363
S 4 C2C4 (jp40217)	5.200-6.100			88726	0.03363	0.03363(a)
S 5 C5+ (jp40217)	6.100-26.000			3706262	1.40480	1.405
S 6 C2+ (jp51209)	5.200-26.000			3794988	8.02456	8.024
S 7 C2C4 (jp51209)	5.200-6.100			88726	0.18761	0.1876
S 8 C5+ (jp51209)	6.100-26.000			3706262	7.83990	7.840
S 66 C13+ (JP51125)	20.247-26.000			198154	9.22989	9.230
S 9 C2+ (gas1028)	5.200-26.000			3794988	1.78259	1.782
S 10 C2-C4 (gas1028)	5.200-6.100			88726	0.04168	0.04168
S 11 C5+ (gas1028)	6.100-26.000			3706262	1.74091	1.741
S 12 C9+ (gas1028)	12.863-26.000			1670242	0.78455	0.7846
S 62 std0330	5.200-26.000			3794988	1.70715	1.707

✓ JC 5/5/99

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).

Air Toxics Limited

RECOVERY REPORT

Client Name:
Sample Matrix: GAS
Lab Smp Id: 290-30btex
Level: LOW
Data Type: GC DATA
SpikeList File: 290-30.spk
Sublist File: all.sub
Client SDG: 05May1999
Fraction: VOA
Client Smp ID: End check
Operator: kr
SampleType: METHSPIKE
Quant Type: ESTD
Method File: /chem/gc6.i/05May1999.b/to3f0407.m/to3b1107.m
Misc Info: 1.07ppmv>0.043ppmv

	SPIKE COMPOUND	CONC ADDED PPMV	CONC RECOVERED PPMV	% RECOVERED	LIMITS
	1 Methyl t-Butyl Eth	0.04300	0.03748	87.16	75-125
	3 Benzene	0.04300	0.03600	83.72	75-125
	5 Toluene	0.04300	0.03364	78.24	75-125
	6 Ethyl Benzene	0.04300	0.03382	78.65	75-125
	7 m,p-Xylenes	0.08600	0.06475	75.29	75-125
	8 o-Xylene	0.04300	0.03236	75.27	75-125
M	9 Total Xylenes	0.1280	0.09711	75.87	75-125

	SURROGATE COMPOUND	CONC ADDED PPMV	CONC RECOVERED PPMV	% RECOVERED	LIMITS
$	4 Fluorobenzene-SURR	0.1020	0.09128	89.49	50-150

KR 5/5/99

Air Toxics Limited

Data file : /chem/gc6.i/05May1999.b/6050521b.d
Lab Smp Id: 290-30btex Client Smp ID: End check
Inj Date : 05-MAY-1999 21:12
Operator : kr Inst ID: gc6.i
Smp Info : 10ml, ; 290-30btex; End check
Misc Info : 1.07ppmv>0.043ppmv
Comment :
Method : /chem/gc6.i/05May1999.b/to3f0407.m/to3b1107.m
Meth Date : 05-May-1999 16:07 jcooper Quant Type: ESTD
Cal Date : 17-FEB-1999 23:53 Cal File: 6021723.d
Als bottle: 1 QC Sample: METHSPIKE
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: all.sub
Target Version: 3.40
Processing Host: frodo

Concentration Formula: Amt * DF

	Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (PPMV)	CONCENTRATIONS FINAL (PPMV)
	1 Methyl t-Butyl Ether	8.400	8.393	0.007	37777	0.03748	0.03748
	11 tba (1006)	Compound Not Detected.					
	3 Benzene	10.590	10.580	0.010	70002	0.03600	0.03600
$	4 Fluorobenzene-SURROGATE	10.857	10.850	0.007	102201	0.09128	0.09128
	5 Toluene	12.670	12.663	0.007	73614	0.03364	0.03364
	6 Ethyl Benzene	14.367	14.360	0.007	69295	0.03382	0.03382
	7 m,p-Xylenes	14.493	14.487	0.006	161943	0.06475	0.06475
	8 o-Xylene	15.010	15.007	0.003	70389	0.03236	0.03236
M	9 Total Xylenes				232332	0.09711	0.09711

KR 5/5/99

Air Toxics Limited

RECOVERY REPORT

Client Name:
Sample Matrix: GAS
Lab Smp Id: 447-71Agas
Level: LOW
Data Type: GC DATA
SpikeList File: 447-71A.spk
Sublist File: all.sub
Method File: /chem/gc6.i/05May1999.b/to3f0407.m
Misc Info: 380ppmv>1.52ppmv

Client SDG: 05May1999
Fraction: VOA
Client Smp ID: End check
Operator: kr
SampleType: METHSPIKE
Quant Type: ESTD

SPIKE COMPOUND	CONC ADDED PPMV	CONC RECOVERED PPMV	% RECOVERED	LIMITS
S 9 C2+ (gas1028)	1.520	1.368	89.99	75-125

SURROGATE COMPOUND	CONC ADDED PPMV	CONC RECOVERED PPMV	% RECOVERED	LIMITS
1 Fluorobenzene *SUR	0.1020	0.1120	109.84	50-150

KR 5/5/1999

Air Toxics Limited

Data file : /chem/gc6.i/05May1999.b/6050520.d
Lab Smp Id: 447-71Agas Client Smp ID: End check
Inj Date : 05-MAY-1999 20:34
Operator : kr Inst ID: gc6.i
Smp Info : 1.0ml, ; 447-71Agas; End check
Misc Info : 380ppmv>1.52ppmv
Comment :
Method : /chem/gc6.i/05May1999.b/to3f0407.m
Meth Date : 05-May-1999 16:07 jcooper Quant Type: ESTD
Cal Date : 06-APR-1998 10:57 Cal File: 6040607.d
Als bottle: 1 QC Sample: METHSPIKE
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: all.sub
Target Version: 3.40
Processing Host: frodo

Concentration Formula: Amt * DF

Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (PPMV)	CONCENTRATIONS FINAL (PPMV)
$ 1 Fluorobenzene *SURR1107*	10.860	10.867	-0.007	133208	0.11203	0.1120
S 2 C2+ (to-12BP0407)	5.200-26.000			2911950	1.50553	1.506
S 3 C2+ (jp40217)	5.200-26.000			2911950	1.10373	1.104
S 64 C2C12(JP40217)	5.200-20.247			2850274	1.08035	1.080
S 4 C2C4 (jp40217)	5.200-6.100			79487	0.03013	0.03013(a)
S 5 C5+ (jp40217)	6.100-26.000			2832463	1.07360	1.074
S 6 C2+ (jp51209)	5.200-26.000			2911950	6.15736	6.157
S 7 C2C4 (jp51209)	5.200-6.100			79487	0.16808	0.1681
S 8 C5+ (jp51209)	6.100-26.000			2832463	5.99154	5.992
S 66 C13+ (JP51125)	20.247-26.000			61676	2.87283	2.873
S 9 C2+ (gas1028)	5.200-26.000			2911950	1.36781	1.368
S 10 C2-C4 (gas1028)	5.200-6.100			79487	0.03734	0.03734(a)
S 11 C5+ (gas1028)	6.100-26.000			2832463	1.33047	1.330
S 12 C9+ (gas1028)	12.863-26.000			1016297	0.47738	0.4774
S 62 stod0330	5.200-26.000			2911950	1.30992	1.310

KR 5/5/99

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).

ort Date : 08-Nov-1998 08:20

Air Toxics Limited

INITIAL CALIBRATION DATA

Start Cal Date : 07-NOV-1998 09:10
End Cal Date : 07-NOV-1998 11:41
Quant Method : ESTD
Origin : Disabled
Target Version : 3.40
Integrator : Falcon
Method file : /chem/gc6.i/07Nov1998.b/to3f1107.m/to3b1107.m
Cal Date : 08-Nov-1998 08:19 S
Curve Type : Average

Calibration File Names:
Level 1: /chem/gc6.i/07Nov1998.b/6110706b.d
Level 2: /chem/gc6.i/07Nov1998.b/6110705b.d
Level 3: /chem/gc6.i/07Nov1998.b/6110704b.d
Level 4: /chem/gc6.i/07Nov1998.b/6110703b.d
Level 5: /chem/gc6.i/07Nov1998.b/6110702b.d

	Compound	ppmV	0.00423 Level 1	0.01070 Level 2	0.04230 Level 3	0.10700 Level 4	0.22400 Level 5	RRF	% RSD
	1 Methyl t-Butyl Ether		985981	1064486	1012056	983654	993687	1007973	3.324
	11 cha (1006)		-----	-----	-----	-----	-----	-----	-----
	3 Benzene		1956542	2057850	1928832	1866579	1912673	1944495	3.666
	5 Toluene		2369393	2298224	2149696	2039187	2084584	2238217	6.437
	6 Ethyl Benzene		2033645	2190935	2051262	1942037	2027112	2048998	4.386
	7 m,p-Xylenes		2605257	2758925	2487874	2282042	2371171	2501054	7.543
	8 o-Xylene		2176158	2378224	2157593	2041935	2120626	2174909	5.737
M	9 Total Xylenes		2462227	2632025	2377780	2202006	2297656	2392339	6.923
S	4 Fluorobenzene-SURROGATE		1036167	1134510	1133196	1098794	1195461	1119624	5.199

Second Source: 6110708b.d
RLV: 6110707b.d

11/8/98

JJT 11.9.98

Air Toxics Limited

INITIAL CALIBRATION DATA

Start Cal Date : 28-OCT-1998 10:47
End Cal Date : 28-OCT-1998 14:50
Quant Method : ESTD
Origin : Disabled
Target Version : 3.40
Integrator : Falcon
Method file : /chem/gc6.i/28Oct1998.b/gas1028.m
Cal Date : 28-Oct-1998 15:49 g
Curve Type : Average

Calibration File Names:
Level 1: /chem/gc6.i/28Oct1998.b/6102810.d
Level 2: /chem/gc6.i/28Oct1998.b/6102807.d
Level 3: /chem/gc6.i/28Oct1998.b/6102808.d
Level 4: /chem/gc6.i/28Oct1998.b/6102805.d
Level 5: /chem/gc6.i/28Oct1998.b/6102806.d

Compound	0.03920 Level 1	0.78400 Level 2	1.568 Level 3	7.840 Level 4	15.680 Level 5	___ RRF	% RSD
S 9 C2- (gas1028)	2496097	2535849	2040885	1800001	1721753	2129917	19.572
S 1 Fluorobenzene *SURR1021*	-----	-----	-----	-----	-----	-----	-----

10/28/98
10.28.98

Air Toxics Limited

INITIAL CALIBRATION DATA

Start Cal Date : 07-NOV-1998 09:10
End Cal Date : 07-NOV-1998 11:41
Quant Method : ESTD
Origin : Disabled
Target Version : 3.40
Integrator : Falcon
Method file : /chem/gc6.i/07Nov1998.b/surr1107.m
Cal Date : 08-Nov-1998 08:14 g
Curve Type : Average

Calibration File Names:
Level 1: /chem/gc6.i/07Nov1998.b/6110702.d
Level 2: /chem/gc6.i/07Nov1998.b/6110703.d
Level 3: /chem/gc6.i/07Nov1998.b/6110704.d
Level 4: /chem/gc6.i/07Nov1998.b/6110705.d
Level 5: /chem/gc6.i/07Nov1998.b/6110706.d

Compound	0.10000 Level 1	0.10000 Level 2	0.10000 Level 3	0.10000 Level 4	0.10000 Level 5	RRF	% RSD
Fluorobenzene *SURR1107	1203613	1173755	1189627	1187573	1210430	1189014	1.608

11/5/97

DJM 11.9.98

AIR TOXICS LTD.
AN ENVIRONMENTAL ANALYTICAL LABORATORY

180 BLUE RAVINE ROAD, SUITE B
FOLSOM, CA 95630-4719
(916) 985-1000 FAX: (916) 985-1020

CHAIN-OF-CUSTODY RECORD

Nº 018276

Page 1 of 1

Contact Person: John Hicks
Company: Parsons ES
Address: 1700 Broadway Suite 900 City: Denver State: CO Zip: 80290
Phone: 303 764 1941 FAX: 303 831 8208
Collected By: Signature: Lee Gordon

Project info:
P.O. #:
Project #:
Project Name: Faker Mil Gas Station

Turn Around Time:
☒ Normal
☐ Rush ____ Specify

ES 4-1-87

Lab I.D.	Field Sample I.D.	Date & Time	Analyses Requested	Canister Pressure / Vacuum Initial	Final	Receipt
01A	P-10 - 2 feet	4-22-99 1300				1.0 "Hg
02A	P-10 - surface	4-22-99 1335				1.5 "Hg
03A	P-13	4-22-99 1330				1.0 "Hg

Relinquished By: (Signature) Date/Time: Lee Gordon
Print Name: Lee Gordon 4-26-99 1630
Relinquished By: (Signature) Date/Time
Received By: (Signature) Date/Time
Relinquished By: (Signature) Date/Time
Received By: (Signature) Date/Time: Michelle Arledge AL 4/27/99 1005

Notes:

Lab Use Only

Shipper Name	Air Bill #	Opened By:	Date/Time	Temp. (°C)	Condition	Custody Seals Intact?	Work Order #
Fed-Ex	4124195304164	TS	4/27/99 1005	Ambient	Good	(Yes) No None N/A	9904408

Form 1293 rev 06

Quanterra Incorporated
4955 Yarrow Street
Arvada, Colorado 80002

303 421-6611 Telephone
303 431-7171 Fax

ANALYTICAL REPORT

Eaker AFB
Eaker Military Gas Station

Lot #: D9D010149

John Hicks

Parsons Engineering Services

QUANTERRA INCORPORATED



Ellen La Riviere
Project Manager

April 28, 1999

Project Narrative
(D9D010149)

With exceptions noted below and on the data sheets, standard analytical protocols were followed in the analyses of the samples and no problems were encountered or anomalies observed. All laboratory quality control samples analyzed in conjunction with the samples in this project were within acceptable limits.

Sample Receipt

Samples contained in this lot were received from Parsons Engineering Science on April 1st 1999. Tests were not identified for sample 074-MW010-004 on the chain of custody, and the BTEX analysis was only partially selected for sample 074-SB007-005. Testing requirements were clarified by the client on April 1st and 7th.

GC Volatile GRO

The Method 8015-GRO surrogate, a,a,a-trifluorotoluene, was recovered slightly above the acceptance criteria in the ending check standard. All sample surrogates and batch QC samples were in control, so the laboratory took no further actions.

GC Semi-Volatile DRO

The Method 8015-DRO surrogate, o-terphenyl, was recovered below the lower control limit in the method blank. The secondary surrogate, octacosane, was within acceptable limits. Because all of the sample surrogates and other quality control samples were in control, the laboratory took no further action.

EXECUTIVE SUMMARY - Detection Highlights

D9D010149

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
074-SB006-003 03/30/99 09:00 001				
Benzene	0.00086 F	0.010	mg/kg	SW846 8021B
Benzene	0.00086 F	0.010	mg/kg	SW846 8021B
Benzene	0.00052 F	0.010	mg/kg	SW846 8021B
Gasoline Range Organics	0.62 F	1.0	mg/kg	SW846 8015 MOD
Percent Moisture	3.9	0.10	%	ASTM D 2216-90
074-SB006-004 03/30/99 09:10 002				
Benzene	0.0024 F	0.013	mg/kg	SW846 8021B
Benzene	0.0024 F	0.013	mg/kg	SW846 8021B
Benzene	0.0015 F	0.013	mg/kg	SW846 8021B
Gasoline Range Organics	1.1 F	1.3	mg/kg	SW846 8015 MOD
Percent Moisture	20.3	0.10	%	ASTM D 2216-90
074-SB006-104 03/30/99 09:20 003				
Gasoline Range Organics	0.63 F	1.2	mg/kg	SW846 8015 MOD
Percent Moisture	19.7	0.10	%	ASTM D 2216-90
074-SB007-004 03/30/99 10:00 004				
Benzene	0.019	0.012	mg/kg	SW846 8021B
Benzene	0.019	0.012	mg/kg	SW846 8021B
Benzene	0.020	0.012	mg/kg	SW846 8021B
Gasoline Range Organics	1.2	1.2	mg/kg	SW846 8015 MOD
Percent Moisture	19.2	0.10	%	ASTM D 2216-90
074-SB007-005 03/30/99 10:10 005				
Benzene	0.0093 F	0.012	mg/kg	SW846 8021B
Benzene	0.0093 F	0.012	mg/kg	SW846 8021B
Benzene	0.0090 F	0.012	mg/kg	SW846 8021B
Gasoline Range Organics	0.71 F	1.2	mg/kg	SW846 8015 MOD
Percent Moisture	19.2	0.10	%	ASTM D 2216-90
074-MW010-004 03/30/99 10:15 006				
Total Organic Carbon	1650 B	2000	mg/kg	SW846 9060
Percent Moisture	20.4	0.10	%	ASTM D 2216-90

METHODS SUMMARY

D9D010149

PARAMETER	ANALYTICAL METHOD	PREPARATION METHOD
Extractable Petroleum Hydrocarbons	SW846 8015 MOD	SW846 3550
Method for Determination of Water Content of Soil	ASTM D 2216-90	ASTM D2216-90
Polynuclear Aromatic Hydrocarbons by HPLC	SW846 8310	SW846 3550
Total Organic Carbon	SW846 9060	SW846 9060
Volatile Petroleum Hydrocarbons	SW846 8015 MOD	SW846 5030
Volatiles by GC	SW846 8021B	SW846 5030

References:

ASTM Annual Book Of ASTM Standards.

SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

SAMPLE SUMMARY

D9D010149

WO #	SAMPLE#	CLIENT SAMPLE ID	DATE	TIME
CT7HW	001	074-SB006-003	03/30/99	09:00
CT7J5	002	074-SB006-004	03/30/99	09:10
CT7J8	003	074-SB006-104	03/30/99	09:20
CT7J9	004	074-SB007-004	03/30/99	10:00
CT7JC	005	074-SB007-005	03/30/99	10:10
CT7JD	006	074-MW010-004	03/30/99	10:15

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

PARSONS Engineering Science, INC.

Client Sample ID: 074-SB006-003

GC Volatiles

Lot-Sample #...: D9D010149-001	**Work Order #...:** CT7HW101	**Matrix.....:** SO	
Date Sampled...: 03/30/99 09:00	**Date Received..:** 04/01/99		
Prep Date.....: 04/05/99	**Analysis Date..:** 04/05/99		
Prep Batch #...: 9109214	**Analysis Time..:** 12:24		
Dilution Factor: 1			
% Moisture.....: 3.9	**Method.....:** SW846 8021B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methyl tert-butyl ether	ND	0.052	mg/kg
Benzene	**0.00086 F**	**0.010**	**mg/kg**
Ethylbenzene	ND	0.010	mg/kg
Toluene	ND	0.010	mg/kg
Xylenes (total)	ND	0.010	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	100	(77 - 118)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

F The analyte was identified but the value was below the RL and above the MDL.

1C

PARSONS Engineering Science, INC.

Client Sample ID: 074-SB006-003

GC Volatiles

Lot-Sample #...:	D9D010149-001	**Work Order #...:**	CT7HW10D	**Matrix.....:**	SO
Date Sampled...:	03/30/99 09:00	**Date Received..:**	04/01/99		
Prep Date.....:	04/05/99	**Analysis Date..:**	04/05/99		
Prep Batch #...:	9109214	**Analysis Time..:**	12:24		
Dilution Factor:	1				
% Moisture.....:	3.9	**Method.....:**	SW846 8021B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methyl tert-butyl ether	ND	0.052	mg/kg
Benzene	**0.00052 F**	**0.010**	**mg/kg**
Ethylbenzene	ND	0.010	mg/kg
Toluene	ND	0.010	mg/kg
Xylenes (total)	ND	0.010	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	98	(77 - 118)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

F The analyte was identified but the value was below the RL and above the MDL.

2C

PARSONS Engineering Science, INC.

Client Sample ID: 074-SB006-004

GC Volatiles

Lot-Sample #...:	D9D010149-002	**Work Order #...:**	CT7J5101	**Matrix.....:**	SO
Date Sampled...:	03/30/99 09:10	**Date Received..:**	04/01/99		
Prep Date.....:	04/05/99	**Analysis Date..:**	04/05/99		
Prep Batch #...:	9109214	**Analysis Time..:**	14:09		
Dilution Factor:	1				
% Moisture.....:	20	**Method.....:**	SW846 8021B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methyl tert-butyl ether	ND	0.063	mg/kg
Benzene	**0.0024 F**	**0.013**	**mg/kg**
Ethylbenzene	ND	0.013	mg/kg
Toluene	ND	0.013	mg/kg
Xylenes (total)	ND	0.013	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	100	(77 - 118)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

F The analyte was identified but the value was below the RL and above the MDL.

1C

PARSONS Engineering Science, INC.

Client Sample ID: 074-SB006-004

GC Volatiles

Lot-Sample #...:	D9D010149-002	**Work Order #...:**	CT7J5106	**Matrix.....:**	SO
Date Sampled...:	03/30/99 09:10	**Date Received..:**	04/01/99		
Prep Date.....:	04/05/99	**Analysis Date..:**	04/05/99		
Prep Batch #...:	9109214	**Analysis Time..:**	14:09		
Dilution Factor:	1				
% Moisture.....:	20	**Method.....:**	SW846 8021B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methyl tert-butyl ether	ND	0.063	mg/kg
Benzene	**0.0015 F**	**0.013**	**mg/kg**
Ethylbenzene	ND	0.013	mg/kg
Toluene	ND	0.013	mg/kg
Xylenes (total)	ND	0.013	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	99	(77 - 118)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

F The analyte was identified but the value was below the RL and above the MDL.

2C

PARSONS Engineering Science, INC.

Client Sample ID: 074-SB006-104

GC Volatiles

Lot-Sample #...:	D9D010149-003	Work Order #...:	CT7J8101	Matrix.....:	SO
Date Sampled...:	03/30/99 09:20	Date Received..:	04/01/99		
Prep Date.....:	04/05/99	Analysis Date..:	04/05/99		
Prep Batch #...:	9109214	Analysis Time..:	14:44		
Dilution Factor:	1				
% Moisture.....:	20	Method.....:	SW846 8021B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methyl tert-butyl ether	ND	0.062	mg/kg
Benzene	ND	0.012	mg/kg
Ethylbenzene	ND	0.012	mg/kg
Toluene	ND	0.012	mg/kg
Xylenes (total)	ND	0.012	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	101	(77 - 118)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

PARSONS Engineering Science, INC.

Client Sample ID: 074-SB007-004

GC Volatiles

Lot-Sample #...:	D9D010149-004	**Work Order #...:**	CT7J9101	**Matrix.....:**	SO
Date Sampled...:	03/30/99 10:00	**Date Received..:**	04/01/99		
Prep Date.....:	04/05/99	**Analysis Date..:**	04/05/99		
Prep Batch #...:	9109214	**Analysis Time..:**	15:20		
Dilution Factor:	1				
% Moisture.....:	19	**Method.....:**	SW846 8021B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methyl tert-butyl ether	ND	0.062	mg/kg
Benzene	**0.019**	**0.012**	**mg/kg**
Ethylbenzene	ND	0.012	mg/kg
Toluene	ND	0.012	mg/kg
Xylenes (total)	ND	0.012	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	94	(77 - 118)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

1C

PARSONS Engineering Science, INC.

Client Sample ID: 074-SB007-004

GC Volatiles

Lot-Sample #...:	D9D010149-004	**Work Order #...:**	CT7J9106	**Matrix.....:**	SO
Date Sampled...:	03/30/99 10:00	**Date Received..:**	04/01/99		
Prep Date.....:	04/05/99	**Analysis Date..:**	04/05/99		
Prep Batch #...:	9109214	**Analysis Time..:**	15:20		
Dilution Factor:	1				
% Moisture.....:	19	**Method.....:**	SW846 8021B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methyl tert-butyl ether	ND	0.062	mg/kg
Benzene	**0.020**	**0.012**	**mg/kg**
Ethylbenzene	ND	0.012	mg/kg
Toluene	ND	0.012	mg/kg
Xylenes (total)	ND	0.012	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	95	(77 - 118)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

2C

PARSONS Engineering Science, INC.

Client Sample ID: 074-SB007-005

GC Volatiles

Lot-Sample #...:	D9D010149-005	**Work Order #...:**	CT7JC101	**Matrix.....:**	SO
Date Sampled...:	03/30/99 10:10	**Date Received..:**	04/01/99		
Prep Date.....:	04/05/99	**Analysis Date..:**	04/05/99		
Prep Batch #...:	9109214	**Analysis Time..:**	15:55		
Dilution Factor:	1				
% Moisture.....:	19	**Method.....:**	SW846 8021B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methyl tert-butyl ether	ND	0.062	mg/kg
Benzene	**0.0093 F**	**0.012**	**mg/kg**
Ethylbenzene	ND	0.012	mg/kg
Toluene	ND	0.012	mg/kg
Xylenes (total)	ND	0.012	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	97	(77 - 118)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

F The analyte was identified but the value was below the RL and above the MDL.

1C

PARSONS Engineering Science, INC.

Client Sample ID: 074-SB007-005

GC Volatiles

Lot-Sample #...:	D9D010149-005	Work Order #...:	CT7JC106	Matrix.....:	SO
Date Sampled...:	03/30/99 10:10	Date Received..:	04/01/99		
Prep Date.....:	04/05/99	Analysis Date..:	04/05/99		
Prep Batch #...:	9109214	Analysis Time..:	15:55		
Dilution Factor:	1				
% Moisture.....:	19	Method.....:	SW846 8021B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methyl tert-butyl ether	ND	0.062	mg/kg
Benzene	**0.0090 F**	**0.012**	**mg/kg**
Ethylbenzene	ND	0.012	mg/kg
Toluene	ND	0.012	mg/kg
Xylenes (total)	ND	0.012	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	95	(77 - 118)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

F The analyte was identified but the value was below the RL and above the MDL.

2C

PARSONS Engineering Science, INC.

Client Sample ID: 074-SB006-003

GC Volatiles

Lot-Sample #...:	D9D010149-001	Work Order #...:	CT7HW104	Matrix.....:	SO
Date Sampled...:	03/30/99 09:00	Date Received..:	04/01/99		
Prep Date.....:	04/02/99	Analysis Date..:	04/07/99		
Prep Batch #...:	9104351	Analysis Time..:	18:39		
Dilution Factor:	1				
% Moisture.....:	3.9	Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	0.62 F	1.0	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	99	(64 - 148)

NOTE(S):

F The analyte was identified but the value was below the RL and above the MDL.

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

PARSONS Engineering Science, INC.

Client Sample ID: 074-SB006-004

GC Volatiles

Lot-Sample #...: D9D010149-002 Work Order #...: CT7J5104 Matrix.....: SO
Date Sampled...: 03/30/99 09:10 Date Received..: 04/01/99
Prep Date.....: 04/02/99 Analysis Date..: 04/07/99
Prep Batch #...: 9104351 Analysis Time..: 20:54
Dilution Factor: 1
% Moisture.....: 20 Method.....: SW846 8015 MOD

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	1.1 F	1.3	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	122	(64 - 148)

NOTE(S):

F The analyte was identified but the value was below the RL and above the MDL.

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

PARSONS Engineering Science, INC.

Client Sample ID: 074-SB006-104

GC Volatiles

Lot-Sample #...:	D9D010149-003	Work Order #...:	CT7J8104	Matrix.....:	SO
Date Sampled...:	03/30/99 09:20	Date Received..:	04/01/99		
Prep Date.....:	04/02/99	Analysis Date..:	04/07/99		
Prep Batch #...:	9104351	Analysis Time..:	21:39		
Dilution Factor:	1				
% Moisture.....:	20	Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	0.63 F	1.2	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	101	(64 - 148)

NOTE(S):

F The analyte was identified but the value was below the RL and above the MDL.

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

PARSONS Engineering Science, INC.

Client Sample ID: 074-SB007-004

GC Volatiles

Lot-Sample #...:	D9D010149-004	Work Order #...:	CT7J9104	Matrix.....:	SO
Date Sampled...:	03/30/99 10:00	Date Received..:	04/01/99		
Prep Date.....:	04/02/99	Analysis Date..:	04/07/99		
Prep Batch #...:	9104351	Analysis Time..:	22:24		
Dilution Factor:	1				
% Moisture.....:	19	Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	1.2	1.2	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	90	(64 - 148)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

PARSONS Engineering Science, INC.

Client Sample ID: 074-SB007-005

GC Volatiles

Lot-Sample #...:	D9D010149-005	**Work Order #...:**	CT7JC104	**Matrix.....:**	SO
Date Sampled...:	03/30/99 10:10	**Date Received..:**	04/01/99		
Prep Date.....:	04/02/99	**Analysis Date..:**	04/07/99		
Prep Batch #...:	9104351	**Analysis Time..:**	23:08		
Dilution Factor:	1				
% Moisture.....:	19	**Method.....:**	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	**0.71 F**	**1.2**	**mg/kg**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	96	(64 - 148)

NOTE(S):

F The analyte was identified but the value was below the RL and above the MDL.

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

PARSONS Engineering Science, INC.

Client Sample ID: 074-SB006-003

GC Semivolatiles

Lot-Sample #...:	D9D010149-001	Work Order #...:	CT7HW103	Matrix.....:	SO
Date Sampled...:	03/30/99 09:00	Date Received..:	04/01/99		
Prep Date.....:	04/08/99	Analysis Date..:	04/17/99		
Prep Batch #...:	9098207	Analysis Time..:	07:44		
Dilution Factor:	1				
% Moisture.....:	3.9	Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	ND	10	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	65	(47 - 142)
n-Octacosane	84	(25 - 162)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

PARSONS Engineering Science, INC.

Client Sample ID: 074-SB006-004

GC Semivolatiles

Lot-Sample #...:	D9D010149-002	**Work Order #...:**	CT7J5103	**Matrix.....:**	SO
Date Sampled...:	03/30/99 09:10	**Date Received..:**	04/01/99		
Prep Date.....:	04/08/99	**Analysis Date..:**	04/17/99		
Prep Batch #...:	9098207	**Analysis Time..:**	08:21		
Dilution Factor:	1				
% Moisture.....:	20	**Method.....:**	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	ND	13	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	78	(47 - 142)
n-Octacosane	100	(25 - 162)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

PARSONS Engineering Science, INC.

Client Sample ID: 074-SB006-104

GC Semivolatiles

Lot-Sample #...: D9D010149-003	**Work Order #...:** CT7J8103	**Matrix.....:** SO	
Date Sampled...: 03/30/99 09:20	**Date Received..:** 04/01/99		
Prep Date.....: 04/08/99	**Analysis Date..:** 04/17/99		
Prep Batch #...: 9098207	**Analysis Time..:** 08:59		
Dilution Factor: 1			
% Moisture.....: 20	**Method.....:** SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	ND	12	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	83	(47 - 142)
n-Octacosane	101	(25 - 162)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

PARSONS Engineering Science, INC.

Client Sample ID: 074-SB007-004

GC Semivolatiles

Lot-Sample #...:	D9D010149-004	**Work Order #...:**	CT7J9103	**Matrix.....:**	SO
Date Sampled...:	03/30/99 10:00	**Date Received..:**	04/01/99		
Prep Date.....:	04/08/99	**Analysis Date..:**	04/17/99		
Prep Batch #...:	9098207	**Analysis Time..:**	09:37		
Dilution Factor:	1				
% Moisture.....:	19	**Method.....:**	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	ND	12	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	75	(47 - 142)
n-Octacosane	95	(25 - 162)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

PARSONS Engineering Science, INC.

Client Sample ID: 074-SB007-005

GC Semivolatiles

Lot-Sample #...: D9D010149-005	Work Order #...: CT7JC103	Matrix.....: SO	
Date Sampled...: 03/30/99 10:10	Date Received..: 04/01/99		
Prep Date.....: 04/08/99	Analysis Date..: 04/17/99		
Prep Batch #...: 9098207	Analysis Time..: 10:15		
Dilution Factor: 1			
% Moisture.....: 19	Method.....: SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	ND	12	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	83	(47 - 142)
n-Octacosane	101	(25 - 162)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

PARSONS Engineering Science, INC.

Client Sample ID: 074-SB006-003

HPLC

Lot-Sample #...:	D9D010149-001	**Work Order #...:**	CT7HW102	**Matrix.....:**	SO
Date Sampled...:	03/30/99 09:00	**Date Received..:**	04/01/99		
Prep Date.....:	04/08/99	**Analysis Date..:**	04/15/99		
Prep Batch #...:	9097380	**Analysis Time..:**	03:05		
Dilution Factor:	1				
% Moisture.....:	3.9	**Method.....:**	SW846 8310		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzo(a)pyrene	ND	21	ug/kg
Naphthalene	ND	210	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Terphenyl-d14	61	(22 - 167)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

PARSONS Engineering Science, INC.

Client Sample ID: 074-SB006-004

HPLC

Lot-Sample #...:	D9D010149-002	Work Order #...:	CT7J5102	Matrix.....:	SO
Date Sampled...:	03/30/99 09:10	Date Received..:	04/01/99		
Prep Date.....:	04/08/99	Analysis Date..:	04/15/99		
Prep Batch #...:	9097380	Analysis Time..:	03:35		
Dilution Factor:	1				
% Moisture.....:	20	Method.....:	SW846 8310		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzo(a)pyrene	ND	25	ug/kg
Naphthalene	ND	250	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Terphenyl-d14	64	(22 - 167)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

PARSONS Engineering Science, INC.

Client Sample ID: 074-SB006-104

HPLC

Lot-Sample #...:	D9D010149-003	**Work Order #...:**	CT7J8102	**Matrix.....:**	SO
Date Sampled...:	03/30/99 09:20	**Date Received..:**	04/01/99		
Prep Date.....:	04/08/99	**Analysis Date..:**	04/15/99		
Prep Batch #...:	9097380	**Analysis Time..:**	04:04		
Dilution Factor:	1				
% Moisture.....:	20	**Method.....:**	SW846 8310		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzo(a)pyrene	ND	25	ug/kg
Naphthalene	ND	250	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Terphenyl-d14	62	(22 - 167)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

PARSONS Engineering Science, INC.

Client Sample ID: 074-SB007-004

HPLC

Lot-Sample #...:	D9D010149-004	Work Order #...:	CT7J9102	Matrix.....:	SO
Date Sampled...:	03/30/99 10:00	Date Received..:	04/01/99		
Prep Date.....:	04/08/99	Analysis Date..:	04/15/99		
Prep Batch #...:	9097380	Analysis Time..:	04:34		
Dilution Factor:	1				
% Moisture.....:	19	Method.....:	SW846 8310		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzo(a)pyrene	ND	25	ug/kg
Naphthalene	ND	250	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Terphenyl-d14	63	(22 - 167)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

PARSONS Engineering Science, INC.

Client Sample ID: 074-SB007-005

HPLC

Lot-Sample #...:	D9D010149-005	**Work Order #...:**	CT7JC102	**Matrix.....:**	SO
Date Sampled...:	03/30/99 10:10	**Date Received..:**	04/01/99		
Prep Date.....:	04/08/99	**Analysis Date..:**	04/15/99		
Prep Batch #...:	9097380	**Analysis Time..:**	05:04		
Dilution Factor:	1				
% Moisture.....:	19	**Method.....:**	SW846 8310		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzo(a)pyrene	ND	25	ug/kg
Naphthalene	ND	250	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Terphenyl-d14	64	(22 - 167)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

Quot # 26758-1

Chain of Custody Record

Quanterra

QUA-4124

Client: Persons Eng. Science	Project Manager: John Hicks	Date: 3-30-99	Chain Of Custody Number: 19466
Address: 1700 West Broadway Suite 900	Telephone Number (Area Code)/Fax Number: 303 831-8100 / 8208	Lab Number: D9D010149	Page 1 of 1
City: Denver / State: CO / Zip Code: 80290	Site Contact: Lee Gorday		
Project Name: Baker Military Gas Station	Carrier/Waybill Number:		
Contract/Purchase Order/Quote No.			

Sample I.D. No. and Description	Date	Time	Sample Type	Total Volume	Containers Type	Containers No.	Preservative	Condition on Receipt	Analysis: BTEX (1)	TPH-G (1)	MTBE (1)	Naphthalene (1)	Benzo(a) pyrene (1)	TPH-D (1)
-001 074-SB006-003	3/31/99	0900	Soil	2402 1/16oz	glass	3	—		X	X	X	X	X	X
-002 074-SB006-004	↓	0910	↓	↓	↓	↓			X	X	X	X	X	X
-003 074-SB006-104		0920							X	X	X	X	X	X
-004 074-SB007-004		1000							X	X	X	X	X	X
-005 074-SB007-005		1010							1	X	X	X	X	X
-006 074-MW010-004	3/31/99	1015	Soil	1 16oz	glass		—							

Special Instructions

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Turn Around Time Required
☐ Normal ☐ Rush

QC Level
☐ I. ☐ II. ☐ III.

Project Specific (Specify)

	Date	Time		Date	Time
1. Relinquished By			1. Received By	4/1/99	0900
2. Relinquished By			2. Received By		
3. Relinquished By			3. Received By		

Comments
54

DISTRIBUTION: WHITE - Stays with Sample; CANARY - Returned to Client with Report; PINK - Field Copy

Sample Receiving Checklist

Lot #: D9D010149 Date/Time Received: 040199 0900

Company Name & Sampling Site: Eaker AFB - C ST.

*Cooler #(s): ____ ____ ____ ____ ____ ____ ____ ____

Temperatures: 4.2 ____ ____ ____ ____ ____ ____ ____

Unpacking & Labeling Check Points:

N/A	Yes	No		Initials
	☑	☐	1. Cooler seals intact.	
	☑	☐	2. Chain of custody present.	
	☐	☑	3. Bottles broken and/or are leaking, comment if yes.	
			PHOTOGRAPH BROKEN BOTTLES	
	☑	☐	4. Containers labeled, comment if no.	
	☐	☑	5. pH of all samples checked and meet requirements, note exceptions.	
	☑	☐	6. Chain of custody includes "received by" and "relinquished" by signatures, dates, and times.	
	☐	☑	7. Receipt date(s) > 48 hours past the collection date(s)? If yes, notify PA/PM.	
	☑	☐	8. Chain of custody agrees with bottle count, comment if no.	
	☑	☐	9. Chain of custody agrees with labels, comment if no.	
☑	☐	☐	10. VOA samples filled completely, comment if no.	
☑	☐	☐	11. VOA bottles preserved, check for labels.	
	☐	☑	12. Did samples require preservation with sodium thiosulfate?	
☐	☐	☑	13. If yes to #12, did the samples contain residual chlorine?	
☐	☐	☑	14. Sediment present in "D," dissolved, bottles.	
	☐	☑	15. Are analyses with short holding times requested?	
☐	☐	☑	16. Is extra sample volume provided for MS, MSD or matrix duplicates?	
	☐	☑	17. Multiphase samples present? If yes, comment below.	
	☐	☑	18. Any subsampling for volatiles? If yes, list samples.	
			PHOTOGRAPH MULTIPHASE SAMPLES	
☑	☐	☐	19. Clear picture taken, labeled, and stapled to project folder.	
☑	☐	☐	20. Subcontract COC signed and sent with samples to bottle prep?	
	☑	☐	21. Was sample labeling double checked by a second person?	

Document any problems or discrepancies and the actions taken to resolve them on a Condition Upon Receipt Anomaly Report (CUR)

Quanterra Incorporated
4955 Yarrow Street
Arvada, Colorado 80002

303 421-6611 Telephone
303 431-7171 Fax

ANALYTICAL REPORT

Eaker AFB
Eaker Military Gas Station

Lot #: D9D060111

John Hicks

Parsons Engineering Services

QUANTERRA INCORPORATED



Ellen La Riviere
Project Manager

May 5, 1999

Project Narrative
(D9D060111)

With exceptions noted below and on the data sheets, standard analytical protocols were followed in the analyses of the samples and no problems were encountered or anomalies observed. All laboratory quality control samples analyzed in conjunction with the samples in this project were within acceptable limits.

Sample Receipt

Three trip blanks were received at the laboratory, but were not listed on the chains of custody. The trip blanks were logged in for Method 8021B.

The times of collection were missing for two chains of custody. The collection time information was related to the laboratory during a telephone conversation with the client.

One 40 ml vial was received at the laboratory broken for client ID 074-GW008-001 and one one liter amber bottle was received at the laboratory broken for client ID 074-GW006-001. The laboratory was still able to complete all analyses.

GC Volatile -BTEX

Due to a power failure, the Method 8021B analytical holding times were missed for samples D9D060111-001, -003 through –010, -018, -019 and –020. The client was contacted on April 27, 1999 and requested the laboratory report the data.0

Samples D9D060111-004, -009, -010, -015, -017, -018 and –020 were analyzed at dilutions for Method 8021B due to the concentration of target compounds in the samples. Sample D9D060111-013 was analyzed at a dilution for Method 8021B due to the presence of non-target compounds. As a result of the dilutions required, the surrogates were diluted to less than detectable concentrations in samples D9D060111-0013, -0015 and –017.

GC Volatile - GRO

Samples D9D060111-004, -009, -010, -013, -014, -015, -0017, -0018 and –020 were analyzed at dilutions for Method 8015-GRO due to the concentration of target compounds in the samples. As a result of the dilutions required, the surrogates were diluted to less than detectable concentrations in samples D9D060111-0013, -0015 and –017.

The ending continuing calibration verification standard for the Method 8015-GRO batch 910633 and the ending continuing calibration verification standard for the Method 8015-GRO batch 9106281 exceeded the control limit for the surrogate, a,a,a-trifluorotoluene. All sample surrogates were within acceptable limits or were diluted to less than detectable concentrations. The laboratory took no further action.

GC Semi-Volatile DRO

The Method 8015-DRO surrogate, n-octacosane, was recovered above the upper control limit in sample D9D060111-013. The surrogate, o-terphenyl, was within acceptable limits.

The Method 8015-DRO surrogate, o-terphenyl, was recovered below the lower control limit in the method blank associated with batch 9098207. The secondary surrogate, octacosane, was within acceptable limits. Because all sample surrogates and other quality control samples were in control, the laboratory took no further action.

Polynuclear Aromatic Hydrocarbons

Samples D9D060111-004, -009, -010 and –018 were analyzed at dilutions for Method 8310 due to the concentrations of target compounds in the samples. As a result of the dilutions required, the surrogates were diluted to less than detectable concentrations in these samples.

Methane by RSK-175

The methane analysis by RSK-175 was performed by Quanterra's laboratory located in Austin, Texas.

Samples D9D060111-004, -009, -010, -018 and –020 were originally analyzed undiluted with methane detected at concentrations above the linear calibration range of the instrument. These results have been reported with "E flags." The samples were reanalyzed at the appropriate dilutions. Both sets of data have been reported.

EXECUTIVE SUMMARY - Detection Highlights

D9D060111

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
GW008-001 04/03/99 12:00 001				
Methane	0.21 J,B	0.50	ug/L	RSK SOP-175
Gasoline Range Organics	0.0076 F	0.10	mg/L	SW846 8015 MOD
Nitrate-Nitrite	4.8	0.10	mg/L	MCAWW 353.2
GW011-001 04/03/99 10:30 002				
Diesel Range Organics	0.13 F	1.0	mg/L	SW846 8015 MOD
Methane	0.96 B	0.50	ug/L	RSK SOP-175
Gasoline Range Organics	0.018 F	0.10	mg/L	SW846 8015 MOD
Nitrate-Nitrite	0.16	0.10	mg/L	MCAWW 353.2
GW009-001 04/01/99 17:20 003				
Diesel Range Organics	0.078 F	1.0	mg/L	SW846 8015 MOD
Nitrate-Nitrite	0.13	0.10	mg/L	MCAWW 353.2
GW004-001 04/02/99 11:30 004				
Diesel Range Organics	2.8	1.0	mg/L	SW846 8015 MOD
Methane	250 B,E	0.50	ug/L	RSK SOP-175
Methane	130 B,D	2.5	ug/L	RSK SOP-175
Benzene	660	10	ug/L	SW846 8021B
Benzene	660	10	ug/L	SW846 8021B
Ethylbenzene	550	50	ug/L	SW846 8021B
Ethylbenzene	550	50	ug/L	SW846 8021B
Toluene	65	10	ug/L	SW846 8021B
Toluene	65	10	ug/L	SW846 8021B
Xylenes (total)	1400	50	ug/L	SW846 8021B
Xylenes (total)	1400	50	ug/L	SW846 8021B
Benzene	660	10		SW846 8021B
Ethylbenzene	560	50		SW846 8021B
Toluene	65	10		SW846 8021B
Xylenes (total)	1400	50		SW846 8021B
Naphthalene	290	10	ug/L	SW846 8310
Naphthalene	290	10	ug/L	SW846 8310
Naphthalene	230	10	ug/L	SW846 8310
Nitrate-Nitrite	0.15	0.10	mg/L	MCAWW 353.2
GW006-001 04/03/99 08:00 007				
Methane	0.18 J,B	0.50	ug/L	RSK SOP-175
Gasoline Range Organics	0.045 F	0.10	mg/L	SW846 8015 MOD
Nitrate-Nitrite	0.31	0.10	mg/L	MCAWW 353.2

(Continued on next page)

EXECUTIVE SUMMARY - Detection Highlights

D9D060111

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
GW007-001 04/03/99 10:00 008				
Diesel Range Organics	0.12 F	1.0	mg/L	SW846 8015 MOD
Methane	0.63 B	0.50	ug/L	RSK SOP-175
Toluene	2.1	0.10	ug/L	SW846 8021B
Toluene	2.1	0.10	ug/L	SW846 8021B
Toluene	2.1	0.10		SW846 8021B
Gasoline Range Organics	0.0039 F	0.10	mg/L	SW846 8015 MOD
Nitrate-Nitrite	0.36	0.10	mg/L	MCAWW 353.2
GW012-001 04/02/99 15:45 009				
Diesel Range Organics	1.1	1.0	mg/L	SW846 8015 MOD
Methane	510 B,E	0.50	ug/L	RSK SOP-175
Benzene	7300	50	ug/L	SW846 8021B
Benzene	7300	50	ug/L	SW846 8021B
Ethylbenzene	880	250	ug/L	SW846 8021B
Ethylbenzene	880	250	ug/L	SW846 8021B
Toluene	54	50	ug/L	SW846 8021B
Toluene	54	50	ug/L	SW846 8021B
Benzene	7200	50		SW846 8021B
Ethylbenzene	880	250		SW846 8021B
Toluene	66	50		SW846 8021B
Naphthalene	300	10	ug/L	SW846 8310
Naphthalene	300	10	ug/L	SW846 8310
Naphthalene	260	10	ug/L	SW846 8310
GW002-001 04/02/99 18:30 010				
Diesel Range Organics	1.7	1.0	mg/L	SW846 8015 MOD
Methane	450 B,E	0.50	ug/L	RSK SOP-175
Benzene	2700	10	ug/L	SW846 8021B
Benzene	2700	10	ug/L	SW846 8021B
Ethylbenzene	3500	50	ug/L	SW846 8021B
Ethylbenzene	3500	50	ug/L	SW846 8021B
Toluene	160	10	ug/L	SW846 8021B
Toluene	160	10	ug/L	SW846 8021B
Xylenes (total)	1100	50	ug/L	SW846 8021B
Xylenes (total)	1100	50	ug/L	SW846 8021B
Benzene	2700	10	ug/L	SW846 8021B
Ethylbenzene	3600	50	ug/L	SW846 8021B
Toluene	180	10	ug/L	SW846 8021B
Xylenes (total)	1000	50	ug/L	SW846 8021B
Naphthalene	380	10	ug/L	SW846 8310
Naphthalene	380	10	ug/L	SW846 8310

(Continued on next page)

EXECUTIVE SUMMARY - Detection Highlights

D9D060111

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
GW002-001 04/02/99 18:30 010				
Naphthalene	350	10	ug/L	SW846 8310
SB002-002 04/02/99 17:10 011				
Diesel Range Organics	7.9 F	12	mg/kg	SW846 8015 MOD
Toluene	0.021 F	0.059	mg/kg	SW846 8021B
Toluene	0.021 F	0.059	mg/kg	SW846 8021B
Toluene	0.026 F	0.059	mg/kg	SW846 8021B
Gasoline Range Organics	1.9	1.2	mg/kg	SW846 8015 MOD
Percent Moisture	15.0	0.10	%	ASTM D 2216-90
SB002-004 04/02/99 17:15 012				
Benzene	0.081	0.064	mg/kg	SW846 8021B
Benzene	0.081	0.064	mg/kg	SW846 8021B
Benzene	0.061 F	0.064	mg/kg	SW846 8021B
Ethylbenzene	0.10	0.064	mg/kg	SW846 8021B
Ethylbenzene	0.10	0.064	mg/kg	SW846 8021B
Ethylbenzene	0.085	0.064	mg/kg	SW846 8021B
Toluene	0.31	0.064	mg/kg	SW846 8021B
Toluene	0.31	0.064	mg/kg	SW846 8021B
Toluene	0.34	0.064	mg/kg	SW846 8021B
Xylenes (total)	0.51	0.064	mg/kg	SW846 8021B
Xylenes (total)	0.51	0.064	mg/kg	SW846 8021B
Xylenes (total)	0.51	0.064	mg/kg	SW846 8021B
Gasoline Range Organics	13	1.3	mg/kg	SW846 8015 MOD
Naphthalene	84 F	260	ug/kg	SW846 8310
Naphthalene	84 F	260	ug/kg	SW846 8310
Naphthalene	74 F	260	ug/kg	SW846 8310
Percent Moisture	21.7	0.10	%	ASTM D 2216-90
SB004-002 04/02/99 18:10 013				
Diesel Range Organics	11	11	mg/kg	SW846 8015 MOD
Naphthalene	100 F	230	ug/kg	SW846 8310
Naphthalene	100 F	230	ug/kg	SW846 8310
Naphthalene	100 F	230	ug/kg	SW846 8310
Percent Moisture	13.0	0.10	%	ASTM D 2216-90

(Continued on next page)

EXECUTIVE SUMMARY - Detection Highlights

D9D060111

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
SB005-004 04/02/99 17:40 014				
Diesel Range Organics	55	12	mg/kg	SW846 8015 MOD
Gasoline Range Organics	47	2.4	mg/kg	SW846 8015 MOD
Naphthalene	620	240	ug/kg	SW846 8310
Naphthalene	620	240	ug/kg	SW846 8310
Naphthalene	570	240	ug/kg	SW846 8310
Percent Moisture	17.4	0.10	%	ASTM D 2216-90
SB008-104 04/02/99 16:45 015				
Benzene	0.49 F	1.3	mg/kg	SW846 8021B
Benzene	0.49 F	1.3	mg/kg	SW846 8021B
Benzene	0.49 F	1.3	mg/kg	SW846 8021B
Ethylbenzene	8.2	1.3	mg/kg	SW846 8021B
Ethylbenzene	8.2	1.3	mg/kg	SW846 8021B
Ethylbenzene	8.4	1.3	mg/kg	SW846 8021B
Toluene	7.8	1.3	mg/kg	SW846 8021B
Toluene	7.8	1.3	mg/kg	SW846 8021B
Toluene	11	1.3	mg/kg	SW846 8021B
Xylenes (total)	42	1.3	mg/kg	SW846 8021B
Xylenes (total)	42	1.3	mg/kg	SW846 8021B
Xylenes (total)	51	1.3	mg/kg	SW846 8021B
Percent Moisture	21.3	0.10	%	ASTM D 2216-90
SB008-004 04/02/99 16:45 016				
Benzene	0.050 F	0.063	mg/kg	SW846 8021B
Benzene	0.050 F	0.063	mg/kg	SW846 8021B
Benzene	0.052 F	0.063	mg/kg	SW846 8021B
Xylenes (total)	0.089	0.063	mg/kg	SW846 8021B
Xylenes (total)	0.089	0.063	mg/kg	SW846 8021B
Xylenes (total)	0.085	0.063	mg/kg	SW846 8021B
Gasoline Range Organics	8.0	1.3	mg/kg	SW846 8015 MOD
Percent Moisture	20.4	0.10	%	ASTM D 2216-90
SB008-005 04/02/99 17:00 017				
Diesel Range Organics	13	13	mg/kg	SW846 8015 MOD
Benzene	4.4	1.3	mg/kg	SW846 8021B
Benzene	4.4	1.3	mg/kg	SW846 8021B
Benzene	4.2	1.3	mg/kg	SW846 8021B
Ethylbenzene	39	1.3	mg/kg	SW846 8021B
Ethylbenzene	39	1.3	mg/kg	SW846 8021B
Ethylbenzene	41	1.3	mg/kg	SW846 8021B

(Continued on next page)

EXECUTIVE SUMMARY - Detection Highlights

D9D060111

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
SB008-005 04/02/99 17:00 017				
Toluene	72	1.3	mg/kg	SW846 8021B
Toluene	72	1.3	mg/kg	SW846 8021B
Toluene	85	1.3	mg/kg	SW846 8021B
Xylenes (total)	220	1.3	mg/kg	SW846 8021B
Xylenes (total)	220	1.3	mg/kg	SW846 8021B
Xylenes (total)	210	1.3	mg/kg	SW846 8021B
Naphthalene	2000	260	ug/kg	SW846 8310
Naphthalene	2000	260	ug/kg	SW846 8310
Naphthalene	1600	260	ug/kg	SW846 8310
Percent Moisture	24.0	0.10	%	ASTM D 2216-90
GW003-001 04/02/99 19:30 018				
Diesel Range Organics	2.5	1.0	mg/L	SW846 8015 MOD
Methane	260 B,E	0.50	ug/L	RSK SOP-175
Methane	260 B,D	2.5	ug/L	RSK SOP-175
Ethylbenzene	1000	50	ug/L	SW846 8021B
Benzene	1200	10	ug/L	SW846 8021B
Benzene	1200	10	ug/L	SW846 8021B
Ethylbenzene	1000	50	ug/L	SW846 8021B
Toluene	1600	10	ug/L	SW846 8021B
Toluene	1600	10	ug/L	SW846 8021B
Xylenes (total)	5100	50	ug/L	SW846 8021B
Xylenes (total)	5100	50	ug/L	SW846 8021B
Benzene	1200	10	ug/L	SW846 8021B
Ethylbenzene	1100	50	ug/L	SW846 8021B
Toluene	1600	10	ug/L	SW846 8021B
Xylenes (total)	5400	50	ug/L	SW846 8021B
Naphthalene	100	4.0	ug/L	SW846 8310
Naphthalene	100	4.0	ug/L	SW846 8310
Naphthalene	79	4.0	ug/L	SW846 8310
Nitrate-Nitrite	0.055 B	0.10	mg/L	MCAWW 353.2
GW003-101 04/02/99 20:00 020				
Diesel Range Organics	2.4 F	4.0	mg/L	SW846 8015 MOD
Methane	210 B,D	2.5	ug/L	RSK SOP-175
Methane	250 B,E	0.50	ug/L	RSK SOP-175
Benzene	1200	10	ug/L	SW846 8021B
Benzene	1200	10	ug/L	SW846 8021B
Ethylbenzene	990	50	ug/L	SW846 8021B
Ethylbenzene	990	50	ug/L	SW846 8021B
Toluene	1600	10	ug/L	SW846 8021B

(Continued on next page)

EXECUTIVE SUMMARY - Detection Highlights

D9D060111

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
GW003-101 04/02/99 20:00 020				
Toluene	1600	10	ug/L	SW846 8021B
Xylenes (total)	5100	50	ug/L	SW846 8021B
Xylenes (total)	5100	50	ug/L	SW846 8021B
Benzene	1200	10	ug/L	SW846 8021B
Ethylbenzene	1000	50	ug/L	SW846 8021B
Toluene	1600	10	ug/L	SW846 8021B
Xylenes (total)	5200	50	ug/L	SW846 8021B
Naphthalene	140	5.3	ug/L	SW846 8310
Naphthalene	140	5.3	ug/L	SW846 8310
Naphthalene	110	5.3	ug/L	SW846 8310
Nitrate-Nitrite	0.080 B	0.10	mg/L	MCAWW 353.2

METHODS SUMMARY

D9D060111

PARAMETER	ANALYTICAL METHOD	PREPARATION METHOD
Dissolved Gasses in Water	RSK SOP-175	EPA-9 RSK-175
Extractable Petroleum Hydrocarbons	SW846 8015 MOD	SW846 3510
Extractable Petroleum Hydrocarbons	SW846 8015 MOD	SW846 3550
Method for Determination of Water Content of Soil	ASTM D 2216-90	ASTM D2216-90
Nitrate-Nitrite	MCAWW 353.2	MCAWW 353.2
Polynuclear Aromatic Hydrocarbons by HPLC	SW846 8310	SW846 3510
Polynuclear Aromatic Hydrocarbons by HPLC	SW846 8310	SW846 3550
Volatile Petroleum Hydrocarbons	SW846 8015 MOD	SW846 5030
Volatiles by GC	SW846 8021B	SW846 5030
Volatiles by GC	SW846 8021B	SW846 5035

References:

ASTM Annual Book Of ASTM Standards.

MCAWW "Methods for Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983 and subsequent revisions.

RSK Sample Prep and Calculations for Dissolved Gas Analysis in Water Samples Using a GC Headspace Equilibration Technique, RSKSOP-175, REV. 0, 8/11/94, USEPA Research Lab

SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

SAMPLE SUMMARY

D9D060111

WO #	SAMPLE#	CLIENT SAMPLE ID	DATE	TIME
CTAGR	001	GW008-001	04/03/99	12:00
CTAHE	002	GW011-001	04/03/99	10:30
CTAHP	003	GW009-001	04/01/99	17:20
CTAJ3	004	GW004-001	04/02/99	11:30
CTAJ9	005	TB-1	04/02/99	
CTAJF	006	TB-2	04/02/99	
CTAJJ	007	GW006-001	04/03/99	08:00
CTAJQ	008	GW007-001	04/03/99	10:00
CTAK1	009	GW012-001	04/02/99	15:45
CTAK2	010	GW002-001	04/02/99	18:30
CTAK3	011	SB002-002	04/02/99	17:10
CTAK6	012	SB002-004	04/02/99	17:15
CTAK7	013	SB004-002	04/02/99	18:10
CTAK8	014	SB005-004	04/02/99	17:40
CTAK9	015	SB008-104	04/02/99	16:45
CTAKC	016	SB008-004	04/02/99	16:45
CTAKD	017	SB008-005	04/02/99	17:00
CTAKE	018	GW003-001	04/02/99	19:30
CTAKF	019	TB-3	04/02/99	
CTAMR	020	GW003-101	04/02/99	20:00

NOTE(S):

- Analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

PARSONS Engineering Science, INC.

Client Sample ID: GW008-001

GC Volatiles

Lot-Sample #...: D9D060111-001 Work Order #...: CTAGR101 Matrix.....: WG
Date Sampled...: 04/03/99 12:00 Date Received..: 04/06/99
Prep Date.....: 04/19/99 Analysis Date..: 04/19/99
Prep Batch #...: 9111132 Analysis Time..: 12:56
Dilution Factor: 1
Method.....: SW846 8021B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	ND	0.10	ug/L
Ethylbenzene	ND	0.50	ug/L
Methyl tert-butyl ether	ND	5.0	ug/L
Toluene	ND	0.10	ug/L
Xylenes (total)	ND	0.50	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	106	(82 - 112)
Fluorobenzene	101	(44 - 165)

PARSONS Engineering Science, INC.

Client Sample ID: GW008-001

GC Volatiles

Lot-Sample #...: D9D060111-001 Work Order #...: CTAGR104 Matrix.....: WG
Date Sampled...: 04/03/99 12:00 Date Received..: 04/06/99
Prep Date.....: 04/13/99 Analysis Date..: 04/13/99
Prep Batch #...: 9106313 Analysis Time..: 19:08
Dilution Factor: 1
Method.....: SW846 8015 MOD

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	0.0076 F	0.10	mg/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	100	(74 - 138)

NOTE(S):

F The analyte was identified but the value was below the RL and above the MDL.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

PARSONS Engineering Science, INC.

Client Sample ID: GW011-001

GC Volatiles

Lot-Sample #...: D9D060111-002 Work Order #...: CTAHE101 Matrix.....: WG
Date Sampled...: 04/03/99 10:30 Date Received..: 04/06/99
Prep Date.....: 04/19/99 Analysis Date..: 04/19/99
Prep Batch #...: 9111132 Analysis Time..: 13:31
Dilution Factor: 1
Method.....: SW846 8021B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	ND	0.10	ug/L
Ethylbenzene	ND	0.50	ug/L
Methyl tert-butyl ether	ND	5.0	ug/L
Toluene	ND	0.10	ug/L
Xylenes (total)	ND	0.50	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	102	(82 - 112)
Fluorobenzene	98	(44 - 165)

PARSONS Engineering Science, INC.

Client Sample ID: GW011-001

GC Volatiles

Lot-Sample #...: D9D060111-002 Work Order #...: CTAHE104 Matrix.....: WG
Date Sampled...: 04/03/99 10:30 Date Received..: 04/06/99
Prep Date.....: 04/13/99 Analysis Date..: 04/13/99
Prep Batch #...: 9106313 Analysis Time..: 20:37
Dilution Factor: 1

Method.....: SW846 8015 MOD

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	0.018 F	0.10	mg/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	91	(74 - 138)

NOTE(S):

F The analyte was identified but the value was below the RL and above the MDL.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

PARSONS Engineering Science, INC.

Client Sample ID: GW004-001

GC Volatiles

Lot-Sample #...: D9D060111-004 Work Order #...: CTAJ3101 Matrix.....: WG
Date Sampled...: 04/02/99 11:30 Date Received..: 04/06/99
Prep Date.....: 04/19/99 Analysis Date..: 04/19/99
Prep Batch #...: 9111132 Analysis Time..: 14:08
Dilution Factor: 100
Method.....: SW846 8021B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	**660**	**10**	**ug/L**
Ethylbenzene	**550**	**50**	**ug/L**
Methyl tert-butyl ether	ND	500	ug/L
Toluene	**65**	**10**	**ug/L**
Xylenes (total)	**1400**	**50**	**ug/L**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	101	(82 - 112)
Fluorobenzene	98	(44 - 165)

NOTE(S):
1C

PARSONS Engineering Science, INC.

Client Sample ID: GW004-001

GC Volatiles

Lot-Sample #...: D9D060111-004 Work Order #...: CTAJ3108 Matrix.....: WG
Date Sampled...: 04/02/99 11:30 Date Received..: 04/06/99
Prep Date.....: 04/19/99 Analysis Date..: 04/19/99
Prep Batch #...: 9111132 Analysis Time..: 14:08
Dilution Factor: 100

Method.....: SW846 8021B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	660	10	
Ethylbenzene	560	50	
Methyl tert-butyl ether	ND	500	
Toluene	65	10	
Xylenes (total)	1400	50	

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	99	(82 - 112)
Fluorobenzene	98	(44 - 165)
1,4-Dichlorobutane		(35 - 135)

NOTE(S):

2C

PARSONS Engineering Science, INC.

Client Sample ID: GW004-001

GC Volatiles

Lot-Sample #...: D9D060111-004 Work Order #...: CTAJ3104 Matrix.....: WG
Date Sampled...: 04/02/99 11:30 Date Received..: 04/06/99
Prep Date.....: 04/13/99 Analysis Date..: 04/13/99
Prep Batch #...: 9106313 Analysis Time..: 21:21
Dilution Factor: 100
Method.....: SW846 8015 MOD

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	8.8 F	10	mg/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	95	(74 - 138)

NOTE(S):

F The analyte was identified but the value was below the RL and above the MDL.

PARSONS Engineering Science, INC.

Client Sample ID: TB-1

GC Volatiles

Lot-Sample #...: D9D060111-005 Work Order #...: CTAJ9101 Matrix.....: WQ
Date Sampled...: 04/02/99 Date Received..: 04/06/99
Prep Date.....: 04/19/99 Analysis Date..: 04/19/99
Prep Batch #...: 9111132 Analysis Time..: 14:44
Dilution Factor: 1

Method.....: SW846 8021B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	ND	0.10	ug/L
Ethylbenzene	ND	0.50	ug/L
Toluene	ND	0.10	ug/L
Xylenes (total)	ND	0.50	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	104	(82 - 112)
Fluorobenzene	101	(44 - 165)

PARSONS Engineering Science, INC.

Client Sample ID: TB-2

GC Volatiles

Lot-Sample #...: D9D060111-006	**Work Order #...:** CTAJF101	**Matrix.....:** WQ	
Date Sampled...: 04/02/99	**Date Received..:** 04/06/99		
Prep Date.....: 04/19/99	**Analysis Date..:** 04/19/99		
Prep Batch #...: 9111132	**Analysis Time..:** 15:19		
Dilution Factor: 1			
	Method.....: SW846 8021B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	ND	0.10	ug/L
Ethylbenzene	ND	0.50	ug/L
Toluene	ND	0.10	ug/L
Xylenes (total)	ND	0.50	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	90	(82 - 112)
Fluorobenzene	86	(44 - 165)

PARSONS Engineering Science, INC.

Client Sample ID: GW006-001

GC Volatiles

Lot-Sample #...: D9D060111-007 Work Order #...: CTAJJ101 Matrix.....: WG
Date Sampled...: 04/03/99 08:00 Date Received..: 04/06/99
Prep Date.....: 04/19/99 Analysis Date..: 04/19/99
Prep Batch #...: 9111132 Analysis Time..: 15:55
Dilution Factor: 1
Method.....: SW846 8021B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	ND	0.10	ug/L
Ethylbenzene	ND	0.50	ug/L
Methyl tert-butyl ether	ND	5.0	ug/L
Toluene	ND	0.10	ug/L
Xylenes (total)	ND	0.50	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	101	(82 - 112)
Fluorobenzene	98	(44 - 165)

PARSONS Engineering Science, INC.

Client Sample ID: GW006-001

GC Volatiles

Lot-Sample #...: D9D060111-007 Work Order #...: CTAJJ104 Matrix.....: WG
Date Sampled...: 04/03/99 08:00 Date Received..: 04/06/99
Prep Date.....: 04/13/99 Analysis Date..: 04/13/99
Prep Batch #...: 9106313 Analysis Time..: 22:06
Dilution Factor: 1
Method.....: SW846 8015 MOD

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	0.045 F	0.10	mg/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	103	(74 - 138)

NOTE(S):

F The analyte was identified but the value was below the RL and above the MDL.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

PARSONS Engineering Science, INC.

Client Sample ID: GW007-001

GC Volatiles

Lot-Sample #...: D9D060111-008 Work Order #...: CTAJQ101 Matrix.....: WG
Date Sampled...: 04/03/99 10:00 Date Received..: 04/06/99
Prep Date.....: 04/19/99 Analysis Date..: 04/19/99
Prep Batch #...: 9111132 Analysis Time..: 16:31
Dilution Factor: 1
Method.....: SW846 8021B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	ND	0.10	ug/L
Ethylbenzene	ND	0.50	ug/L
Methyl tert-butyl ether	ND	5.0	ug/L
Toluene	**2.1**	**0.10**	**ug/L**
Xylenes (total)	ND	0.50	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	109	(82 - 112)
Fluorobenzene	100	(44 - 165)

NOTE(S):
1C

PARSONS Engineering Science, INC.

Client Sample ID: GW007-001

GC Volatiles

Lot-Sample #...: D9D060111-008	**Work Order #...:** CTAJQ107	**Matrix.....:** WG	
Date Sampled...: 04/03/99 10:00	**Date Received..:** 04/06/99		
Prep Date.....: 04/19/99	**Analysis Date..:** 04/19/99		
Prep Batch #...: 9111132	**Analysis Time..:** 16:31		
Dilution Factor: 1			
	Method.....: SW846 8021B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	ND	0.10	
Ethylbenzene	ND	0.50	
Methyl tert-butyl ether	ND	5.0	
Toluene	**2.1**	**0.10**	
Xylenes (total)	ND	0.50	

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	103	(82 - 112)
Fluorobenzene	100	(44 - 165)

NOTE(S):

2C

PARSONS Engineering Science, INC.

Client Sample ID: GW007-001

GC Volatiles

Lot-Sample #...: D9D060111-008 Work Order #...: CTAJQ104 Matrix.....: WG
Date Sampled...: 04/03/99 10:00 Date Received..: 04/06/99
Prep Date.....: 04/13/99 Analysis Date..: 04/14/99
Prep Batch #...: 9106313 Analysis Time..: 05:31
Dilution Factor: 1
Method.....: SW846 8015 MOD

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	0.0039 F	0.10	mg/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	77	(74 - 138)

NOTE(S):

F The analyte was identified but the value was below the RL and above the MDL.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

PARSONS Engineering Science, INC.

Client Sample ID: GW012-001

GC Volatiles

Lot-Sample #...: D9D060111-009 **Work Order #...:** CTAK1101 **Matrix.....:** WG
Date Sampled...: 04/02/99 15:45 **Date Received..:** 04/06/99
Prep Date.....: 04/19/99 **Analysis Date..:** 04/19/99
Prep Batch #...: 9111132 **Analysis Time..:** 17:06
Dilution Factor: 500

Method.....: SW846 8021B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	**7300**	**50**	**ug/L**
Ethylbenzene	**880**	**250**	**ug/L**
Methyl tert-butyl ether	ND	2500	ug/L
Toluene	**54**	**50**	**ug/L**
Xylenes (total)	ND	250	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	103	(82 - 112)
Fluorobenzene	100	(44 - 165)

NOTE(S):

1C

PARSONS Engineering Science, INC.

Client Sample ID: GW012-001

GC Volatiles

Lot-Sample #...: D9D060111-009 Work Order #...: CTAK1108 Matrix.....: WG
Date Sampled...: 04/02/99 15:45 Date Received..: 04/06/99
Prep Date.....: 04/19/99 Analysis Date..: 04/19/99
Prep Batch #...: 9111132 Analysis Time..: 17:06
Dilution Factor: 500

Method.....: SW846 8021B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	**7200**	**50**	
Ethylbenzene	**880**	**250**	
Methyl tert-butyl ether	ND	2500	
Toluene	**66**	**50**	
Xylenes (total)	ND	250	

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	102	(82 - 112)
Fluorobenzene	99	(44 - 165)

NOTE(S):
2C

PARSONS Engineering Science, INC.

Client Sample ID: GW012-001

GC Volatiles

Lot-Sample #...: D9D060111-009 Work Order #...: CTAK1104 Matrix.....: WG
Date Sampled...: 04/02/99 15:45 Date Received..: 04/06/99
Prep Date.....: 04/13/99 Analysis Date..: 04/14/99
Prep Batch #...: 9106313 Analysis Time..: 06:15
Dilution Factor: 500
Method.....: SW846 8015 MOD

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	20 F	50	mg/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	108	(74 - 138)

NOTE(S):

F The analyte was identified but the value was below the RL and above the MDL.

PARSONS Engineering Science, INC.

Client Sample ID: GW002-001

GC Volatiles

Lot-Sample #...: D9D060111-010 Work Order #...: CTAK2101 Matrix.....: WG
Date Sampled...: 04/02/99 18:30 Date Received..: 04/06/99
Prep Date.....: 04/19/99 Analysis Date..: 04/19/99
Prep Batch #...: 9111132 Analysis Time..: 18:17
Dilution Factor: 100

Method.....: SW846 8021B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	**2700**	**10**	**ug/L**
Ethylbenzene	**3500**	**50**	**ug/L**
Methyl tert-butyl ether	ND	500	ug/L
Toluene	**160**	**10**	**ug/L**
Xylenes (total)	**1100**	**50**	**ug/L**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	107	(82 - 112)
Fluorobenzene	101	(44 - 165)

NOTE(S):

1C

PARSONS Engineering Science, INC.

Client Sample ID: GW002-001

GC Volatiles

Lot-Sample #...:	D9D060111-010	**Work Order #...:**	CTAK2108	**Matrix.....:**	WG
Date Sampled...:	04/02/99 18:30	**Date Received..:**	04/06/99		
Prep Date.....:	04/19/99	**Analysis Date..:**	04/19/99		
Prep Batch #...:	9111132	**Analysis Time..:**	18:17		
Dilution Factor:	100				
		Method.....:	SW846 8021B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	**2700**	**10**	**ug/L**
Ethylbenzene	**3600**	**50**	**ug/L**
Methyl tert-butyl ether	ND	500	ug/L
Toluene	**180**	**10**	**ug/L**
Xylenes (total)	**1000**	**50**	**ug/L**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	100	(82 - 112)
Fluorobenzene	101	(44 - 165)

NOTE(S):

2C

PARSONS Engineering Science, INC.

Client Sample ID: GW002-001

GC Volatiles

Lot-Sample #...: D9D060111-010 Work Order #...: CTAK2104 Matrix.....: WG
Date Sampled...: 04/02/99 18:30 Date Received..: 04/06/99
Prep Date.....: 04/13/99 Analysis Date..: 04/13/99
Prep Batch #...: 9106313 Analysis Time..: 07:00
Dilution Factor: 100
Method.....: SW846 8015 MOD

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	13	10	mg/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	108	(74 - 138)

PARSONS Engineering Science, INC.

Client Sample ID: SB002-002

GC Volatiles

Lot-Sample #...:	D9D060111-011	**Work Order #...:**	CTAK3101	**Matrix.....:**	SO
Date Sampled...:	04/02/99 17:10	**Date Received..:**	04/06/99		
Prep Date.....:	04/07/99	**Analysis Date..:**	04/15/99		
Prep Batch #...:	9113151	**Analysis Time..:**	23:32		
Dilution Factor:	1				
% Moisture.....:	15	**Method.....:**	SW846 8021B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methyl tert-butyl ether	ND	0.059	mg/kg
Benzene	ND	0.059	mg/kg
Ethylbenzene	ND	0.059	mg/kg
Toluene	**0.021 F**	**0.059**	**mg/kg**
Xylenes (total)	ND	0.059	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	97	(77 - 118)
Fluorobenzene	122	(34 - 175)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

F The analyte was identified but the value was below the RL and above the MDL.

1C

PARSONS Engineering Science, INC.

Client Sample ID: SB002-002

GC Volatiles

Lot-Sample #...:	D9D060111-011	**Work Order #...:**	CTAK3106	**Matrix.....:**	SO
Date Sampled...:	04/02/99 17:10	**Date Received..:**	04/06/99		
Prep Date.....:	04/07/99	**Analysis Date..:**	04/15/99		
Prep Batch #...:	9113151	**Analysis Time..:**	23:32		
Dilution Factor:	1				
% Moisture.....:	15	**Method.....:**	SW846 8021B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methyl tert-butyl ether	ND	0.059	mg/kg
Benzene	ND	0.059	mg/kg
Ethylbenzene	ND	0.059	mg/kg
Toluene	**0.026 F**	**0.059**	**mg/kg**
Xylenes (total)	ND	0.059	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	96	(77 - 118)
Fluorobenzene	122	(34 - 175)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

F The analyte was identified but the value was below the RL and above the MDL.

PARSONS Engineering Science, INC.

Client Sample ID: SB002-002

GC Volatiles

Lot-Sample #...:	D9D060111-011	Work Order #...:	CTAK3104	Matrix.....:	SO
Date Sampled...:	04/02/99 17:10	Date Received..:	04/06/99		
Prep Date.....:	04/07/99	Analysis Date..:	04/12/99		
Prep Batch #...:	9106281	Analysis Time..:	15:43		
Dilution Factor:	1				
% Moisture.....:	15	Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	1.9	1.2	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	107	(64 - 148)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

PARSONS Engineering Science, INC.

Client Sample ID: SB002-004

GC Volatiles

Lot-Sample #...: D9D060111-012 Work Order #...: CTAK6101 Matrix.....: SO
Date Sampled...: 04/02/99 17:15 Date Received..: 04/06/99
Prep Date.....: 04/07/99 Analysis Date..: 04/16/99
Prep Batch #...: 9113151 Analysis Time..: 00:08
Dilution Factor: 1
% Moisture.....: 22 Method.....: SW846 8021B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methyl tert-butyl ether	ND	0.064	mg/kg
Benzene	**0.081**	**0.064**	**mg/kg**
Ethylbenzene	**0.10**	**0.064**	**mg/kg**
Toluene	**0.31**	**0.064**	**mg/kg**
Xylenes (total)	**0.51**	**0.064**	**mg/kg**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	96	(77 - 118)
Fluorobenzene	121	(34 - 175)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

1C

PARSONS Engineering Science, INC.

Client Sample ID: SB002-004

GC Volatiles

Lot-Sample #...:	D9D060111-012	Work Order #...:	CTAK6107	Matrix.....:	SO
Date Sampled...:	04/02/99 17:15	Date Received..:	04/06/99		
Prep Date.....:	04/07/99	Analysis Date..:	04/16/99		
Prep Batch #...:	9113151	Analysis Time..:	00:08		
Dilution Factor:	1				
% Moisture.....:	22	Method.....:	SW846 8021B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methyl tert-butyl ether	ND	0.064	mg/kg
Benzene	**0.061 F**	**0.064**	**mg/kg**
Ethylbenzene	**0.085**	**0.064**	**mg/kg**
Toluene	**0.34**	**0.064**	**mg/kg**
Xylenes (total)	**0.51**	**0.064**	**mg/kg**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	89	(77 - 118)
Fluorobenzene	117	(34 - 175)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

F The analyte was identified but the value was below the RL and above the MDL.

2C

PARSONS Engineering Science, INC.

Client Sample ID: SB002-004

GC Volatiles

Lot-Sample #...: D9D060111-012	Work Order #...: CTAK6104	Matrix.....: SO	
Date Sampled...: 04/02/99 17:15	Date Received..: 04/06/99		
Prep Date.....: 04/07/99	Analysis Date..: 04/12/99		
Prep Batch #...: 9106281	Analysis Time..: 16:28		
Dilution Factor: 1			
% Moisture.....: 22	Method.....: SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	13	1.3	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	99	(64 - 148)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics that are similar to gasoline.

PARSONS Engineering Science, INC.

Client Sample ID: SB004-002

GC Volatiles

Lot-Sample #...:	D9D060111-013	**Work Order #...:**	CTAK7101	**Matrix.....:**	SO
Date Sampled...:	04/02/99 18:10	**Date Received..:**	04/06/99		
Prep Date.....:	04/07/99	**Analysis Date..:**	04/16/99		
Prep Batch #...:	9113151	**Analysis Time..:**	01:20		
Dilution Factor:	5				
% Moisture.....:	13	**Method.....:**	SW846 8021B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methyl tert-butyl ether	ND	0.29	mg/kg
Benzene	ND	0.29	mg/kg
Ethylbenzene	ND	0.29	mg/kg
Toluene	ND	0.29	mg/kg
Xylenes (total)	ND	0.29	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	0.0 DIL	(77 - 118)
Fluorobenzene	0.0 DIL	(34 - 175)

NOTE(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

Results and reporting limits have been adjusted for dry weight.

PARSONS Engineering Science, INC.

Client Sample ID: SB004-002

GC Volatiles

Lot-Sample #...: D9D060111-013 Work Order #...: CTAK7104 Matrix.....: SO
Date Sampled...: 04/02/99 18:10 Date Received..: 04/06/99
Prep Date.....: 04/07/99 Analysis Date..: 04/12/99
Prep Batch #...: 9106281 Analysis Time..: 17:13
Dilution Factor: 20
% Moisture.....: 13 Method.....: SW846 8015 MOD

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	340	23	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	0.0 DIL	(64 - 148)

NOTE(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics that are similar to gasoline.

Resubmitted
5/21/99

PARSONS Engineering Science, INC.

Client Sample ID: SB005-004

GC Volatiles

Lot-Sample #...:	D9D060111-014	**Work Order #...:**	CTAK8101	**Matrix.....:**	SO
Date Sampled...:	04/02/99 17:40	**Date Received..:**	04/06/99		
Prep Date.....:	04/07/99	**Analysis Date..:**	04/16/99		
Prep Batch #...:	9113151	**Analysis Time..:**	07:45		
Dilution Factor:	1				
% Moisture.....:	17	**Method.....:**	SW846 8021B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methyl tert-butyl ether	ND	0.061	mg/kg
Benzene	ND	0.061	mg/kg
Ethylbenzene	ND	0.061	mg/kg
Toluene	ND	0.061	mg/kg
Xylenes (total)	ND	0.061	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	96	(77 - 118)
Fluorobenzene	86	(34 - 175)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

PARSONS Engineering Science, INC.

Client Sample ID: SB005-004

GC Volatiles

Lot-Sample #...:	D9D060111-014	Work Order #...:	CTAK8104	Matrix.....:	SO
Date Sampled...:	04/02/99 17:40	Date Received..:	04/06/99		
Prep Date.....:	04/07/99	Analysis Date..:	04/12/99		
Prep Batch #...:	9106281	Analysis Time..:	17:58		
Dilution Factor:	2				
% Moisture.....:	17	Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	47	2.4	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	105	(64 - 148)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics that are similar to weathered gasoline.

PARSONS Engineering Science, INC.

Client Sample ID: SB008-104

GC Volatiles

Lot-Sample #...:	D9D060111-015	Work Order #...:	CTAK9101	Matrix.....:	SO
Date Sampled...:	04/02/99 16:45	Date Received..:	04/06/99		
Prep Date.....:	04/07/99	Analysis Date..:	04/16/99		
Prep Batch #...:	9113151	Analysis Time..:	09:32		
Dilution Factor:	20				
% Moisture.....:	21	Method.....:	SW846 8021B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methyl tert-butyl ether	ND	1.3	mg/kg
Benzene	**0.49 F**	**1.3**	**mg/kg**
Ethylbenzene	**8.2**	**1.3**	**mg/kg**
Toluene	**7.8**	**1.3**	**mg/kg**
Xylenes (total)	**42**	**1.3**	**mg/kg**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	0.0 DIL	(77 - 118)
Fluorobenzene	0.0 DIL	(34 - 175)

NOTE(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

Results and reporting limits have been adjusted for dry weight.

F The analyte was identified but the value was below the RL and above the MDL.

1C

PARSONS Engineering Science, INC.

Client Sample ID: SB008-104

GC Volatiles

Lot-Sample #...:	D9D060111-015	Work Order #...:	CTAK9106	Matrix.....:	SO
Date Sampled...:	04/02/99 16:45	Date Received..:	04/06/99		
Prep Date.....:	04/07/99	Analysis Date..:	04/16/99		
Prep Batch #...:	9113151	Analysis Time..:	09:32		
Dilution Factor:	20				
% Moisture.....:	21	Method.....:	SW846 8021B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methyl tert-butyl ether	ND	1.3	mg/kg
Benzene	**0.49 F**	**1.3**	**mg/kg**
Ethylbenzene	**8.4**	**1.3**	**mg/kg**
Toluene	**11**	**1.3**	**mg/kg**
Xylenes (total)	**51**	**1.3**	**mg/kg**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	0.0 DIL	(77 - 118)
Fluorobenzene	0.0 DIL	(34 - 175)

NOTE(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

Results and reporting limits have been adjusted for dry weight.

F The analyte was identified but the value was below the RL and above the MDL.

PARSONS Engineering Science, INC.

Client Sample ID: SB008-104

GC Volatiles

Lot-Sample #...:	D9D060111-015	Work Order #...:	CTAK9104	Matrix.....:	SO
Date Sampled...:	04/02/99 16:45	Date Received..:	04/06/99		
Prep Date.....:	04/07/99	Analysis Date..:	04/12/99		
Prep Batch #...:	9106281	Analysis Time..:	20:58		
Dilution Factor:	50				
% Moisture.....:	21	Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	1100	64	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	0.0 DIL	(64 - 148)

NOTE(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics that are similar to gasoline.

Resubmitted
5/21/99

PARSONS Engineering Science, INC.

Client Sample ID: SB008-004

GC Volatiles

Lot-Sample #...:	D9D060111-016	Work Order #...:	CTAKC101	Matrix.....:	SO
Date Sampled...:	04/02/99 16:45	Date Received..:	04/06/99		
Prep Date.....:	04/07/99	Analysis Date..:	04/16/99		
Prep Batch #...:	9113151	Analysis Time..:	10:08		
Dilution Factor:	1				
% Moisture.....:	20	Method.....:	SW846 8021B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methyl tert-butyl ether	ND	0.063	mg/kg
Benzene	**0.050 F**	**0.063**	**mg/kg**
Ethylbenzene	ND	0.063	mg/kg
Toluene	ND	0.063	mg/kg
Xylenes (total)	**0.089**	**0.063**	**mg/kg**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	84	(77 - 118)
Fluorobenzene	102	(34 - 175)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

F The analyte was identified but the value was below the RL and above the MDL.

PARSONS Engineering Science, INC.

Client Sample ID: SB008-004

GC Volatiles

Lot-Sample #...:	D9D060111-016	**Work Order #...:**	CTAKC106	**Matrix.....:**	SO
Date Sampled...:	04/02/99 16:45	**Date Received..:**	04/06/99		
Prep Date.....:	04/07/99	**Analysis Date..:**	04/16/99		
Prep Batch #...:	9113151	**Analysis Time..:**	10:08		
Dilution Factor:	1				
% Moisture.....:	20	**Method.....:**	SW846 8021B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methyl tert-butyl ether	ND	0.063	mg/kg
Benzene	**0.052 F**	**0.063**	**mg/kg**
Ethylbenzene	ND	0.063	mg/kg
Toluene	ND	0.063	mg/kg
Xylenes (total)	**0.085**	**0.063**	**mg/kg**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	84	(77 - 118)
Fluorobenzene	106	(34 - 175)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

F The analyte was identified but the value was below the RL and above the MDL.

2C

PARSONS Engineering Science, INC.

Client Sample ID: SB008-004

GC Volatiles

Lot-Sample #...: D9D060111-016	Work Order #...: CTAKC104	Matrix.....: SO	
Date Sampled...: 04/02/99 16:45	Date Received..: 04/06/99		
Prep Date.....: 04/07/99	Analysis Date..: 04/12/99		
Prep Batch #...: 9106281	Analysis Time..: 21:43		
Dilution Factor: 1			
% Moisture.....: 20	Method.....: SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	8.0	1.3	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	87	(64 - 148)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics that are similar to weathered gasoline.

PARSONS Engineering Science, INC.

Client Sample ID: SB008-005

GC Volatiles

Lot-Sample #...:	D9D060111-017	**Work Order #...:**	CTAKD101	**Matrix.....:**	SO
Date Sampled...:	04/02/99 17:00	**Date Received..:**	04/06/99		
Prep Date.....:	04/07/99	**Analysis Date..:**	04/16/99		
Prep Batch #...:	9113151	**Analysis Time..:**	10:44		
Dilution Factor:	20				
% Moisture.....:	24	**Method.....:**	SW846 8021B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methyl tert-butyl ether	ND	1.3	mg/kg
Benzene	**4.4**	**1.3**	**mg/kg**
Ethylbenzene	**39**	**1.3**	**mg/kg**
Toluene	**72**	**1.3**	**mg/kg**
Xylenes (total)	**220**	**1.3**	**mg/kg**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	0.0 DIL	(77 - 118)
Fluorobenzene	0.0 DIL	(34 - 175)

NOTE(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

Results and reporting limits have been adjusted for dry weight.

1C

PARSONS Engineering Science, INC.

Client Sample ID: SB008-005

GC Volatiles

Lot-Sample #...: D9D060111-017 Work Order #...: CTAKD107 Matrix.....: SO
Date Sampled...: 04/02/99 17:00 Date Received..: 04/06/99
Prep Date.....: 04/07/99 Analysis Date..: 04/16/99
Prep Batch #...: 9113151 Analysis Time..: 10:44
Dilution Factor: 20
% Moisture.....: 24 Method.....: SW846 8021B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methyl tert-butyl ether	ND	1.3	mg/kg
Benzene	4.2	1.3	mg/kg
Ethylbenzene	41	1.3	mg/kg
Toluene	85	1.3	mg/kg
Xylenes (total)	210	1.3	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	0.0 DIL	(77 - 118)
Fluorobenzene	0.0 DIL	(34 - 175)

NOTE(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

Results and reporting limits have been adjusted for dry weight.

PARSONS Engineering Science, INC.

Client Sample ID: SB008-005

GC Volatiles

Lot-Sample #...:	D9D060111-017	Work Order #...: CTAKD104	Matrix.....: SO
Date Sampled...:	04/02/99 17:00	Date Received..: 04/06/99	
Prep Date.....:	04/07/99	Analysis Date..: 04/12/99	
Prep Batch #...:	9106281	Analysis Time..: 22:28	
Dilution Factor:	200		
% Moisture.....:	24	Method.....: SW846 8015 MOD	

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	2500	260	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	0.0 DIL	(64 - 148)

NOTE(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics that are similar to gasoline.

Resubmitted
5/21/99

PARSONS Engineering Science, INC.

Client Sample ID: GW003-001

GC Volatiles

Lot-Sample #...: D9D060111-018 Work Order #...: CTAKE101 Matrix.....: WG
Date Sampled...: 04/02/99 19:30 Date Received..: 04/06/99
Prep Date.....: 04/19/99 Analysis Date..: 04/19/99
Prep Batch #...: 9111132 Analysis Time..: 18:53
Dilution Factor: 100

Method.....: SW846 8021B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methyl tert-butyl ether	ND	500	ug/L
Benzene	**1200**	**10**	**ug/L**
Ethylbenzene	**1000**	**50**	**ug/L**
Toluene	**1600**	**10**	**ug/L**
Xylenes (total)	**5100**	**50**	**ug/L**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	105	(82 - 112)
Fluorobenzene	101	(44 - 165)

NOTE(S):

1C

PARSONS Engineering Science, INC.

Client Sample ID: GW003-001

GC Volatiles

Lot-Sample #...:	D9D060111-018	**Work Order #...:**	CTAKE108	**Matrix.....:**	WG
Date Sampled...:	04/02/99 19:30	**Date Received..:**	04/06/99		
Prep Date.....:	04/19/99	**Analysis Date..:**	04/19/99		
Prep Batch #...:	9111132	**Analysis Time..:**	18:53		
Dilution Factor:	100				
		Method.....:	SW846 8021B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	**1200**	**10**	**ug/L**
Ethylbenzene	**1100**	**50**	**ug/L**
Methyl tert-butyl ether	ND	500	ug/L
Toluene	**1600**	**10**	**ug/L**
Xylenes (total)	**5400**	**50**	**ug/L**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	103	(82 - 112)
Fluorobenzene	103	(44 - 165)

NOTE(S):

2C

PARSONS Engineering Science, INC.

Client Sample ID: GW003-001

GC Volatiles

Lab Sample #...:	D9D060111-018	Work Order #...:	CTAKE104	Matrix.....:	WG
Date Sampled...:	04/02/99 19:30	Date Received..:	04/06/99		
Prep Date.....:	04/13/99	Analysis Date..:	04/14/99		
Prep Batch #...:	9106313	Analysis Time..:	07:44		
Dilution Factor:	100				
		Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	9.3 F	10	mg/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	102	(74 - 138)

NOTE(S):

F The analyte was identified but the value was below the RL and above the MDL.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

Resubmitted
5/21/99

PARSONS Engineering Science, INC.

Client Sample ID: TB-3

GC Volatiles

Lot-Sample #...: D9D060111-019 **Work Order #...:** CTAKF101 **Matrix.....:** WQ
Date Sampled...: 04/02/99 **Date Received..:** 04/06/99
Prep Date.....: 04/19/99 **Analysis Date..:** 04/19/99
Prep Batch #...: 9111132 **Analysis Time..:** 19:29
Dilution Factor: 1

Method.....: SW846 8021B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	ND	0.10	ug/L
Ethylbenzene	ND	0.50	ug/L
Toluene	ND	0.10	ug/L
Xylenes (total)	ND	0.50	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	102	(82 - 112)
Fluorobenzene	99	(44 - 165)

PARSONS Engineering Science, INC.

Client Sample ID: GW003-101

GC Volatiles

Lot-Sample #...: D9D060111-020 Work Order #...: CTAMR101 Matrix.....: WG
Date Sampled...: 04/02/99 20:00 Date Received..: 04/06/99
Prep Date.....: 04/19/99 Analysis Date..: 04/19/99
Prep Batch #...: 9111132 Analysis Time..: 20:04
Dilution Factor: 100

Method.....: SW846 8021B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	1200	10	ug/L
Ethylbenzene	990	50	ug/L
Methyl tert-butyl ether	ND	500	ug/L
Toluene	1600	10	ug/L
Xylenes (total)	5100	50	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	105	(82 - 112)
Fluorobenzene	101	(44 - 165)

NOTE(S):

1C

PARSONS Engineering Science, INC.

Client Sample ID: GW003-101

GC Volatiles

Lot-Sample #...:	D9D060111-020	**Work Order #...:**	CTAMR10M	**Matrix.....:**	WG
Date Sampled...:	04/02/99 20:00	**Date Received..:**	04/06/99		
Prep Date.....:	04/19/99	**Analysis Date..:**	04/19/99		
Prep Batch #...:	9111132	**Analysis Time..:**	20:04		
Dilution Factor:	100				
		Method.....:	SW846 8021B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	**1200**	**10**	**ug/L**
Ethylbenzene	**1000**	**50**	**ug/L**
Methyl tert-butyl ether	ND	500	ug/L
Toluene	**1600**	**10**	**ug/L**
Xylenes (total)	**5200**	**50**	**ug/L**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	102	(82 - 112)
Fluorobenzene	100	(44 - 165)

NOTE(S):

2C

PARSONS Engineering Science, INC.

Client Sample ID: GW003-101

GC Volatiles

Lab Sample #...:	D9D060111-020	Work Order #...:	CTAMR104	Matrix.....:	WG
Date Sampled...:	04/02/99 20:00	Date Received..:	04/06/99		
Prep Date.....:	04/13/99	Analysis Date..:	04/14/99		
Prep Batch #...:	9106313	Analysis Time..:	08:29		
Dilution Factor:	100				
		Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	13	10	mg/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	104	(74 - 138)

NOTE(S):

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

Resubmitted
5/21/99

PARSONS Engineering Science, INC.

Client Sample ID: GW008-001

GC Semivolatiles

Lot-Sample #...:	D9D060111-001	**Work Order #...:**	CTAGR103	**Matrix.....:**	WG
Date Sampled...:	04/03/99 12:00	**Date Received..:**	04/06/99		
Prep Date.....:	04/08/99	**Analysis Date..:**	04/16/99		
Prep Batch #...:	9098160	**Analysis Time..:**	22:21		
Dilution Factor:	1				
		Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	ND	1.0	mg/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	75	(57 - 132)
n-Octacosane	96	(26 - 152)

PARSONS Engineering Science, INC.

Client Sample ID: GW011-001

GC Semivolatiles

Lot-Sample #...: D9D060111-002	Work Order #...: CTAHE103	Matrix.....: WG	
Date Sampled...: 04/03/99 10:30	Date Received..: 04/06/99		
Prep Date.....: 04/08/99	Analysis Date..: 04/16/99		
Prep Batch #...: 9098160	Analysis Time..: 22:59		
Dilution Factor: 1			
	Method.....: SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	0.13 F	1.0	mg/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	81	(57 - 132)
n-Octacosane	94	(26 - 152)

NOTE(S):

F The analyte was identified but the value was below the RL and above the MDL.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

Sample resembles a hydrocarbon product occurring within the n-alkane range of C10 to C28.

PARSONS Engineering Science, INC.

Client Sample ID: GW009-001

GC Semivolatiles

Lot-Sample #...:	D9D060111-003	Work Order #...:	CTAHP102	Matrix.....: WG
Date Sampled...:	04/01/99 17:20	Date Received..:	04/06/99	
Prep Date.....:	04/08/99	Analysis Date..:	04/16/99	
Prep Batch #...:	9098160	Analysis Time..:	23:36	
Dilution Factor:	1			
		Method.....:	SW846 8015 MOD	

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	0.078 F	1.0	mg/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	78	(57 - 132)
n-Octacosane	95	(26 - 152)

NOTE(S):

F The analyte was identified but the value was below the RL and above the MDL.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

Sample resembles a hydrocarbon product occurring within the n-alkane range of C10 to C28.

PARSONS Engineering Science, INC.

Client Sample ID: GW004-001

GC Semivolatiles

Lot-Sample #...: D9D060111-004 Work Order #...: CTAJ3103 Matrix.....: WG
Date Sampled...: 04/02/99 11:30 Date Received..: 04/06/99
Prep Date.....: 04/08/99 Analysis Date..: 04/17/99
Prep Batch #...: 9098160 Analysis Time..: 00:14
Dilution Factor: 1

Method.....: SW846 8015 MOD

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	2.8	1.0	mg/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	78	(57 - 132)
n-Octacosane	100	(26 - 152)

NOTE(S):

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

Sample resembles a hydrocarbon product occurring within the n-alkane range of C10 to C28.

PARSONS Engineering Science, INC.

Client Sample ID: GW006-001

GC Semivolatiles

Lot-Sample #...:	D9D060111-007	**Work Order #...:**	CTAJJ103	**Matrix.....:**	WG
Date Sampled...:	04/03/99 08:00	**Date Received..:**	04/06/99		
Prep Date.....:	04/08/99	**Analysis Date..:**	04/17/99		
Prep Batch #...:	9098160	**Analysis Time..:**	00:52		
Dilution Factor:	1				
		Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	ND	1.0	mg/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	77	(57 - 132)
n-Octacosane	100	(26 - 152)

PARSONS Engineering Science, INC.

Client Sample ID: GW007-001

GC Semivolatiles

Lot-Sample #...: D9D060111-008 Work Order #...: CTAJQ103 Matrix.....: WG
Date Sampled...: 04/03/99 10:00 Date Received..: 04/06/99
Prep Date.....: 04/08/99 Analysis Date..: 04/17/99
Prep Batch #...: 9098160 Analysis Time..: 01:29
Dilution Factor: 1

Method.....: SW846 8015 MOD

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	0.12 F	1.0	mg/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	74	(57 - 132)
n-Octacosane	90	(26 - 152)

NOTE(S):

F The analyte was identified but the value was below the RL and above the MDL.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

Sample resembles a hydrocarbon product occurring within the n-alkane range of C10 to C28.

PARSONS Engineering Science, INC.

Client Sample ID: GW012-001

GC Semivolatiles

Lot-Sample #...:	D9D060111-009	**Work Order #...:**	CTAK1103	**Matrix.....:** WG
Date Sampled...:	04/02/99 15:45	**Date Received..:**	04/06/99	
Prep Date.....:	04/08/99	**Analysis Date..:**	04/17/99	
Prep Batch #...:	9098160	**Analysis Time..:**	02:07	
Dilution Factor:	1			
		Method.....:	SW846 8015 MOD	

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	**1.1**	**1.0**	**mg/L**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	73	(57 - 132)
n-Octacosane	73	(26 - 152)

NOTE(S):

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

Sample resembles a hydrocarbon product occurring within the n-alkane range of C10 to C28.

PARSONS Engineering Science, INC.

Client Sample ID: GW002-001

GC Semivolatiles

Lot-Sample #...: D9D060111-010 Work Order #...: CTAK2103 Matrix.....: WG
Date Sampled...: 04/02/99 18:30 Date Received..: 04/06/99
Prep Date.....: 04/08/99 Analysis Date..: 04/17/99
Prep Batch #...: 9098160 Analysis Time..: 03:59
Dilution Factor: 1
Method.....: SW846 8015 MOD

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	1.7	1.0	mg/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	76	(57 - 132)
n-Octacosane	85	(26 - 152)

NOTE(S):

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

Sample resembles a hydrocarbon product occurring within the n-alkane range of C10 to C28.

PARSONS Engineering Science, INC.

Client Sample ID: SB002-002

GC Semivolatiles

Lot-Sample #...:	D9D060111-011	**Work Order #...:**	CTAK3103	**Matrix.....:**	SO
Date Sampled...:	04/02/99 17:10	**Date Received..:**	04/06/99		
Prep Date.....:	04/08/99	**Analysis Date..:**	04/17/99		
Prep Batch #...:	9098207	**Analysis Time..:**	00:52		
Dilution Factor:	1				
% Moisture.....:	15	**Method.....:**	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	**7.9 F**	**12**	**mg/kg**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	77	(47 - 142)
n-Octacosane	95	(25 - 162)

NOTE(S):

F The analyte was identified but the value was below the RL and above the MDL.

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

Sample resembles a hydrocarbon product occurring within the n-alkane range of C10 to C28.

PARSONS Engineering Science, INC.

Client Sample ID: SB002-004

GC Semivolatiles

Lot-Sample #...: D9D060111-012	Work Order #...: CTAK6103	Matrix.....: SO	
Date Sampled...: 04/02/99 17:15	Date Received..: 04/06/99		
Prep Date.....: 04/08/99	Analysis Date..: 04/17/99		
Prep Batch #...: 9098207	Analysis Time..: 01:29		
Dilution Factor: 1			
% Moisture.....: 22	Method.....: SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	ND	13	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	82	(47 - 142)
n-Octacosane	98	(25 - 162)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

PARSONS Engineering Science, INC.

Client Sample ID: SB004-002

GC Semivolatiles

Lot-Sample #...:	D9D060111-013	Work Order #...:	CTAK7103	Matrix.....:	SO
Date Sampled...:	04/02/99 18:10	Date Received..:	04/06/99		
Prep Date.....:	04/08/99	Analysis Date..:	04/17/99		
Prep Batch #...:	9098207	Analysis Time..:	02:07		
Dilution Factor:	1				
% Moisture.....:	13	Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	11	11	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	85	(47 - 142)
n-Octacosane	233 *	(25 - 162)

NOTE(S):

* Surrogate recovery is outside stated control limits.

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

Sample resembles a hydrocarbon product occurring within the n-alkane range of C10 to C28.

PARSONS Engineering Science, INC.

Client Sample ID: SB005-004

GC Semivolatiles

Lot-Sample #...:	D9D060111-014	Work Order #...:	CTAK8103	Matrix.....:	SO
Date Sampled...:	04/02/99 17:40	Date Received..:	04/06/99		
Prep Date.....:	04/08/99	Analysis Date..:	04/17/99		
Prep Batch #...:	9098207	Analysis Time..:	02:44		
Dilution Factor:	1				
% Moisture.....:	17	Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	55	12	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	89	(47 - 142)
n-Octacosane	99	(25 - 162)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

Sample resembles a hydrocarbon product occurring within the n-alkane range of C10 to C28.

PARSONS Engineering Science, INC.

Client Sample ID: SB008-104

GC Semivolatiles

Lot-Sample #...:	D9D060111-015	**Work Order #...:**	CTAK9103	**Matrix.....:**	SO
Date Sampled...:	04/02/99 16:45	**Date Received..:**	04/06/99		
Prep Date.....:	04/08/99	**Analysis Date..:**	04/17/99		
Prep Batch #...:	9098207	**Analysis Time..:**	04:37		
Dilution Factor:	1				
% Moisture.....:	21	**Method.....:**	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	ND	13	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	75	(47 - 142)
n-Octacosane	101	(25 - 162)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

PARSONS Engineering Science, INC.

Client Sample ID: SB008-004

GC Semivolatiles

Lot-Sample #...:	D9D060111-016	Work Order #...:	CTAKC103	Matrix.....:	SO
Date Sampled...:	04/02/99 16:45	Date Received..:	04/06/99		
Prep Date.....:	04/08/99	Analysis Date..:	04/17/99		
Prep Batch #...:	9098207	Analysis Time..:	05:14		
Dilution Factor:	1				
% Moisture.....:	20	Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	ND	13	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	73	(47 - 142)
n-Octacosane	95	(25 - 162)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

PARSONS Engineering Science, INC.

Client Sample ID: SB008-005

GC Semivolatiles

Lot-Sample #...:	D9D060111-017	Work Order #...:	CTAKD103	Matrix.....:	SO
Date Sampled...:	04/02/99 17:00	Date Received..:	04/06/99		
Prep Date.....:	04/08/99	Analysis Date..:	04/17/99		
Prep Batch #...:	9098207	Analysis Time..:	07:07		
Dilution Factor:	1				
% Moisture.....:	24	Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	13	13	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	82	(47 - 142)
n-Octacosane	104	(25 - 162)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

Sample resembles a hydrocarbon product occurring within the n-alkane range of C10 to C28.

PARSONS Engineering Science, INC.

Client Sample ID: GW003-001

GC Semivolatiles

Lot-Sample #...: D9D060111-018 Work Order #...: CTAKE103 Matrix.....: WG
Date Sampled...: 04/02/99 19:30 Date Received..: 04/06/99
Prep Date.....: 04/08/99 Analysis Date..: 04/17/99
Prep Batch #...: 9098160 Analysis Time..: 04:37
Dilution Factor: 1

Method.....: SW846 8015 MOD

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	2.5	1.0	mg/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	83	(57 - 132)
n-Octacosane	92	(26 - 152)

NOTE(S):

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

Sample resembles a hydrocarbon product occurring within the n-alkane range of C10 to C28.

PARSONS Engineering Science, INC.

Client Sample ID: GW003-101

GC Semivolatiles

Lot-Sample #...: D9D060111-020	Work Order #...: CTAMR103	Matrix.....: WG	
Date Sampled...: 04/02/99 20:00	Date Received..: 04/06/99		
Prep Date.....: 04/08/99	Analysis Date..: 04/17/99		
Prep Batch #...: 9098160	Analysis Time..: 05:14		
Dilution Factor: 4			
	Method.....: SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	2.4 F	4.0	mg/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	84	(57 - 132)
n-Octacosane	116	(26 - 152)

NOTE(S):

F The analyte was identified but the value was below the RL and above the MDL.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

Sample resembles a hydrocarbon product occurring within the n-alkane range of C10 to C28.

PARSONS Engineering Science, INC.

Client Sample ID: GW008-001

HPLC

Lot-Sample #...: D9D060111-001 Work Order #...: CTAGR102 Matrix.....: WG
Date Sampled...: 04/03/99 12:00 Date Received..: 04/06/99
Prep Date.....: 04/07/99 Analysis Date..: 04/14/99
Prep Batch #...: 9097221 Analysis Time..: 10:10
Dilution Factor: 1
Method.....: SW846 8310

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzo(a)pyrene	ND	0.10	ug/L
Naphthalene	ND	1.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Terphenyl-d14	60	(25 - 157)

PARSONS Engineering Science, INC.

Client Sample ID: GW011-001

HPLC

Lot-Sample #...:	D9D060111-002	**Work Order #...:**	CTAHE102	**Matrix.....:**	WG
Date Sampled...:	04/03/99 10:30	**Date Received..:**	04/06/99		
Prep Date.....:	04/07/99	**Analysis Date..:**	04/14/99		
Prep Batch #...:	9097221	**Analysis Time..:**	10:40		
Dilution Factor:	1				
		Method.....:	SW846 8310		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzo(a)pyrene	ND	0.10	ug/L
Naphthalene	ND	1.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Terphenyl-d14	60	(25 - 157)

PARSONS Engineering Science, INC.

Client Sample ID: GW009-001

HPLC

Lot-Sample #...:	D9D060111-003	Work Order #...:	CTAHP101	Matrix.....:	WG
Date Sampled...:	04/01/99 17:20	Date Received..:	04/06/99		
Prep Date.....:	04/07/99	Analysis Date..:	04/14/99		
Prep Batch #...:	9097221	Analysis Time..:	11:10		
Dilution Factor:	1				
		Method.....:	SW846 8310		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzo(a)pyrene	ND	0.10	ug/L
Naphthalene	ND	1.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Terphenyl-d14	64	(25 - 157)

PARSONS Engineering Science, INC.

Client Sample ID: GW004-001

HPLC

Lot-Sample #...:	D9D060111-004	Work Order #...:	CTAJ3102	Matrix.....:	WG
Date Sampled...:	04/02/99 11:30	Date Received..:	04/06/99		
Prep Date.....:	04/07/99	Analysis Date..:	04/21/99		
Prep Batch #...:	9097221	Analysis Time..:	16:11		
Dilution Factor:	10				
		Method.....:	SW846 8310		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzo(a)pyrene	ND	1.0	ug/L
Naphthalene	**290**	**10**	**ug/L**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Terphenyl-d14	0.0 DIL	(25 - 157)

NOTE(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

1C

PARSONS Engineering Science, INC.

Client Sample ID: GW004-001

HPLC

Lot-Sample #...: D9D060111-004 Work Order #...: CTAJ3107 Matrix.....: WG
Date Sampled...: 04/02/99 11:30 Date Received..: 04/06/99
Prep Date.....: 04/07/99 Analysis Date..: 04/21/99
Prep Batch #...: 9097221 Analysis Time..: 16:11
Dilution Factor: 10

Method.....: SW846 8310

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzo(a)pyrene	ND	1.0	ug/L
Naphthalene	**230**	**10**	**ug/L**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Terphenyl-d14	0.0 DIL	(25 - 157)

NOTE(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

2C

PARSONS Engineering Science, INC.

Client Sample ID: GW006-001

HPLC

Lot-Sample #...:	D9D060111-007	Work Order #...:	CTAJJ102
Date Sampled...:	04/03/99 08:00	Date Received..:	04/06/99
Prep Date.....:	04/07/99	Analysis Date..:	04/14/99
Prep Batch #...:	9097221	Analysis Time..:	12:09
Dilution Factor:	1		
		Method.....:	SW846 8310

Matrix.....: WG

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzo(a)pyrene	ND	0.10	ug/L
Naphthalene	ND	1.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Terphenyl-d14	55	(25 - 157)

PARSONS Engineering Science, INC.

Client Sample ID: GW007-001

HPLC

Lot-Sample #...: D9D060111-008 Work Order #...: CTAJQ102 Matrix.....: WG
Date Sampled...: 04/03/99 10:00 Date Received..: 04/06/99
Prep Date.....: 04/07/99 Analysis Date..: 04/14/99
Prep Batch #...: 9097221 Analysis Time..: 12:39
Dilution Factor: 1
Method.....: SW846 8310

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzo(a)pyrene	ND	0.10	ug/L
Naphthalene	ND	1.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Terphenyl-d14	61	(25 - 157)

PARSONS Engineering Science, INC.

Client Sample ID: GW012-001

HPLC

Lot-Sample #...:	D9D060111-009	**Work Order #...:**	CTAK1102	**Matrix.....:**	WG
Date Sampled...:	04/02/99 15:45	**Date Received..:**	04/06/99		
Prep Date.....:	04/07/99	**Analysis Date..:**	04/21/99		
Prep Batch #...:	9097221	**Analysis Time..:**	16:41		
Dilution Factor:	10				
		Method.....:	SW846 8310		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzo(a)pyrene	ND	1.0	ug/L
Naphthalene	**300**	**10**	**ug/L**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Terphenyl-d14	0.0 DIL	(25 - 157)

NOTE(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

1C

PARSONS Engineering Science, INC.

Client Sample ID: GW012-001

HPLC

Lot-Sample #...: D9D060111-009 Work Order #...: CTAK1107 Matrix.....: WG
Date Sampled...: 04/02/99 15:45 Date Received..: 04/06/99
Prep Date.....: 04/07/99 Analysis Date..: 04/21/99
Prep Batch #...: 9097221 Analysis Time..: 16:41
Dilution Factor: 10

Method.....: SW846 8310

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzo(a)pyrene	ND	1.0	ug/L
Naphthalene	**260**	**10**	**ug/L**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Terphenyl-d14	0.0 DIL	(25 - 157)

NOTE(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

2C

PARSONS Engineering Science, INC.

Client Sample ID: GW002-001

HPLC

Lot-Sample #...:	D9D060111-010	Work Order #...:	CTAK2102	Matrix.....:	WG
Date Sampled...:	04/02/99 18:30	Date Received..:	04/06/99		
Prep Date.....:	04/07/99	Analysis Date..:	04/21/99		
Prep Batch #...:	9097221	Analysis Time..:	17:11		
Dilution Factor:	10				
		Method.....:	SW846 8310		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzo(a)pyrene	ND	1.0	ug/L
Naphthalene	**380**	**10**	**ug/L**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Terphenyl-d14	0.0 DIL	(25 - 157)

NOTE(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

1C

PARSONS Engineering Science, INC.

Client Sample ID: GW002-001

HPLC

Lot-Sample #...: D9D060111-010 Work Order #...: CTAK2107 Matrix.....: WG
Date Sampled...: 04/02/99 18:30 Date Received..: 04/06/99
Prep Date.....: 04/07/99 Analysis Date..: 04/21/99
Prep Batch #...: 9097221 Analysis Time..: 17:11
Dilution Factor: 10

Method.....: SW846 8310

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzo(a)pyrene	ND	1.0	ug/L
Naphthalene	**350**	**10**	**ug/L**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Terphenyl-d14	0.0 DIL	(25 - 157)

NOTE(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

2C

PARSONS Engineering Science, INC.

Client Sample ID: SB002-002

HPLC

Lot-Sample #...:	D9D060111-011	**Work Order #...:**	CTAK3102	**Matrix.....:**	SO
Date Sampled...:	04/02/99 17:10	**Date Received..:**	04/06/99		
Prep Date.....:	04/08/99	**Analysis Date..:**	04/14/99		
Prep Batch #...:	9097380	**Analysis Time..:**	22:07		
Dilution Factor:	1				
% Moisture.....:	15	**Method.....:**	SW846 8310		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzo(a)pyrene	ND	24	ug/kg
Naphthalene	ND	240	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Terphenyl-d14	65	(22 - 167)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

PARSONS Engineering Science, INC.

Client Sample ID: SB002-004

HPLC

Lot-Sample #...:	D9D060111-012	Work Order #...:	CTAK6102	Matrix.....:	SO
Date Sampled...:	04/02/99 17:15	Date Received..:	04/06/99		
Prep Date.....:	04/08/99	Analysis Date..:	04/14/99		
Prep Batch #...:	9097380	Analysis Time..:	22:37		
Dilution Factor:	1				
% Moisture.....:	22	Method.....:	SW846 8310		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Naphthalene	84 F	260	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Terphenyl-d14	66	(22 - 167)

NOTE(S):

F The analyte was identified but the value was below the RL and above the MDL.

Results and reporting limits have been adjusted for dry weight.

1C

PARSONS Engineering Science, INC.

Client Sample ID: SB002-004

HPLC

Lot-Sample #...:	D9D060111-012	Work Order #...:	CTAK6106	Matrix.....:	SO
Date Sampled...:	04/02/99 17:15	Date Received..:	04/06/99		
Prep Date.....:	04/08/99	Analysis Date..:	04/14/99		
Prep Batch #...:	9097380	Analysis Time..:	22:37		
Dilution Factor:	1				
% Moisture.....:	22	Method.....:	SW846 8310		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Naphthalene	74 F	260	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Terphenyl-d14	64	(22 - 167)

NOTE(S):

F The analyte was identified but the value was below the RL and above the MDL.

Results and reporting limits have been adjusted for dry weight.

2C

PARSONS Engineering Science, INC.

Client Sample ID: SB004-002

HPLC

Lot-Sample #...:	D9D060111-013	Work Order #...:	CTAK7102	Matrix.....:	SO
Date Sampled...:	04/02/99 18:10	Date Received..:	04/06/99		
Prep Date.....:	04/08/99	Analysis Date..:	04/14/99		
Prep Batch #...:	9097380	Analysis Time..:	23:07		
Dilution Factor:	1				
% Moisture.....:	13	Method.....:	SW846 8310		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzo(a)pyrene	ND	23	ug/kg
Naphthalene	**100 F**	**230**	**ug/kg**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Terphenyl-d14	61	(22 - 167)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

F The analyte was identified but the value was below the RL and above the MDL.

1C

PARSONS Engineering Science, INC.

Client Sample ID: SB004-002

HPLC

Lot-Sample #...:	D9D060111-013	**Work Order #...:**	CTAK7106	**Matrix.....:**	SO
Date Sampled...:	04/02/99 18:10	**Date Received..:**	04/06/99		
Prep Date.....:	04/08/99	**Analysis Date..:**	04/14/99		
Prep Batch #...:	9097380	**Analysis Time..:**	23:07		
Dilution Factor:	1				
% Moisture.....:	13	**Method.....:**	SW846 8310		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzo(a)pyrene	ND	23	ug/kg
Naphthalene	**100 F**	**230**	**ug/kg**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Terphenyl-d14	62	(22 - 167)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

F The analyte was identified but the value was below the RL and above the MDL.

2C

PARSONS Engineering Science, INC.

Client Sample ID: SB005-004

HPLC

Lot-Sample #...:	D9D060111-014	Work Order #...:	CTAK8102	Matrix.....:	SO
Date Sampled...:	04/02/99 17:40	Date Received..:	04/06/99		
Prep Date.....:	04/08/99	Analysis Date..:	04/14/99		
Prep Batch #...:	9097380	Analysis Time..:	23:36		
Dilution Factor:	1				
% Moisture.....:	17	Method.....:	SW846 8310		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Naphthalene	620	240	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Terphenyl-d14	62	(22 - 167)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

1C

PARSONS Engineering Science, INC.

Client Sample ID: SB005-004

HPLC

Lot-Sample #...:	D9D060111-014	Work Order #...:	CTAK810F	Matrix.....:	SO
Date Sampled...:	04/02/99 17:40	Date Received..:	04/06/99		
Prep Date.....:	04/08/99	Analysis Date..:	04/14/99		
Prep Batch #...:	9097380	Analysis Time..:	23:36		
Dilution Factor:	1				
% Moisture.....:	17	Method.....:	SW846 8310		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Naphthalene	570	240	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Terphenyl-d14	56	(22 - 167)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

2C

PARSONS Engineering Science, INC.

Client Sample ID: SB008-104

HPLC

Lot-Sample #...: D9D060111-015	Work Order #...: CTAK9102	Matrix.....: SO	
Date Sampled...: 04/02/99 16:45	Date Received..: 04/06/99		
Prep Date.....: 04/08/99	Analysis Date..: 04/15/99		
Prep Batch #...: 9097380	Analysis Time..: 01:36		
Dilution Factor: 1			
% Moisture.....: 21	Method.....: SW846 8310		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Naphthalene	ND	250	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Terphenyl-d14	63	(22 - 167)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

PARSONS Engineering Science, INC.

Client Sample ID: SB008-004

HPLC

Lot-Sample #...:	D9D060111-016	**Work Order #...:**	CTAKC102	**Matrix.....:**	SO
Date Sampled...:	04/02/99 16:45	**Date Received..:**	04/06/99		
Prep Date.....:	04/08/99	**Analysis Date..:**	04/15/99		
Prep Batch #...:	9097380	**Analysis Time..:**	02:05		
Dilution Factor:	1				
% Moisture.....:	20	**Method.....:**	SW846 8310		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Naphthalene	ND	250	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Terphenyl-d14	63	(22 - 167)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

PARSONS Engineering Science, INC.

Client Sample ID: SB008-005

HPLC

Lot-Sample #...:	D9D060111-017	Work Order #...:	CTAKD102	Matrix.....:	SO
Date Sampled...:	04/02/99 17:00	Date Received..:	04/06/99		
Prep Date.....:	04/08/99	Analysis Date..:	04/15/99		
Prep Batch #...:	9097380	Analysis Time..:	02:35		
Dilution Factor:	1				
% Moisture.....:	24	Method.....:	SW846 8310		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Naphthalene	2000	260	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Terphenyl-d14	67	(22 - 167)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

1C

PARSONS Engineering Science, INC.

Client Sample ID: SB008-005

HPLC

Lot-Sample #...:	D9D060111-017	Work Order #...:	CTAKD106	Matrix.....:	SO
Date Sampled...:	04/02/99 17:00	Date Received..:	04/06/99		
Prep Date.....:	04/08/99	Analysis Date..:	04/15/99		
Prep Batch #...:	9097380	Analysis Time..:	02:35		
Dilution Factor:	1				
% Moisture.....:	24	Method.....:	SW846 8310		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Naphthalene	1600	260	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Terphenyl-d14	67	(22 - 167)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

2C

PARSONS Engineering Science, INC.

Client Sample ID: GW003-001

HPLC

Lot-Sample #...: D9D060111-018 Work Order #...: CTAKE102 Matrix.....: WG
Date Sampled...: 04/02/99 19:30 Date Received..: 04/06/99
Prep Date.....: 04/07/99 Analysis Date..: 04/21/99
Prep Batch #...: 9097221 Analysis Time..: 17:41
Dilution Factor: 4
Method.....: SW846 8310

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Naphthalene	100	4.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Terphenyl-d14	0.0 DIL	(25 - 157)

NOTE(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

1C

PARSONS Engineering Science, INC.

Client Sample ID: GW003-001

HPLC

Lot-Sample #...:	D9D060111-018	Work Order #...:	CTAKE107	Matrix.....:	WG
Date Sampled...:	04/02/99 19:30	Date Received..:	04/06/99		
Prep Date.....:	04/07/99	Analysis Date..:	04/21/99		
Prep Batch #...:	9097221	Analysis Time..:	17:41		
Dilution Factor:	4				
		Method.....:	SW846 8310		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Naphthalene	79	4.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Terphenyl-d14	0.0 DIL	(25 - 157)

NOTE(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

2C

PARSONS Engineering Science, INC.

Client Sample ID: GW003-101

HPLC

Lot-Sample #...: D9D060111-020 Work Order #...: CTAMR102 Matrix.....: WG
Date Sampled...: 04/02/99 20:00 Date Received..: 04/06/99
Prep Date.....: 04/07/99 Analysis Date..: 04/21/99
Prep Batch #...: 9097221 Analysis Time..: 18:10
Dilution Factor: 5.3
Method.....: SW846 8310

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Naphthalene	140	5.3	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Terphenyl-d14	0.0 DIL	(25 - 157)

NOTE(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

1C

PARSONS Engineering Science, INC.

Client Sample ID: GW003-101

HPLC

Lot-Sample #...: D9D060111-020	Work Order #...: CTAMR10L	Matrix.....: WG	
Date Sampled...: 04/02/99 20:00	Date Received..: 04/06/99		
Prep Date.....: 04/07/99	Analysis Date..: 04/21/99		
Prep Batch #...: 9097221	Analysis Time..: 18:10		
Dilution Factor: 5.3			
	Method.....: SW846 8310		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Naphthalene	110	5.3	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Terphenyl-d14	0.0 DIL	(25 - 157)

NOTE(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

2C

PARSONS Engineering Science, INC.

Client Sample ID: GW008-001

GC Volatiles

Lot-Sample #...: D9D060111-001 Work Order #...: CTAGR106 Matrix.....: WG
Date Sampled...: 04/03/99 12:00 Date Received..: 04/06/99
Prep Date.....: 04/13/99 Analysis Date..: 04/13/99
Prep Batch #...: 9105150 Analysis Time..: 10:51
Dilution Factor: 1
Method.....: RSK SOP-175

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methane	0.21 J,B	0.50	ug/L

NOTE(S):

J Estimated result. Result is less than RL.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

PARSONS Engineering Science, INC.

Client Sample ID: GW011-001

GC Volatiles

Lot-Sample #...:	D9D060111-002	Work Order #...:	CTAHE106	Matrix.....:	WG
Date Sampled...:	04/03/99 10:30	Date Received..:	04/06/99		
Prep Date.....:	04/13/99	Analysis Date..:	04/13/99		
Prep Batch #...:	9105150	Analysis Time..:	11:03		
Dilution Factor:	1				
		Method.....:	RSK SOP-175		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methane	0.96 B	0.50	ug/L

NOTE(S):

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

PARSONS Engineering Science, INC.

Client Sample ID: GW004-001

GC Volatiles

Lot-Sample #...: D9D060111-004 Work Order #...: CTAJ3106 Matrix.....: WG
Date Sampled...: 04/02/99 11:30 Date Received..: 04/06/99
Prep Date.....: 04/13/99 Analysis Date..: 04/13/99
Prep Batch #...: 9105150 Analysis Time..: 11:08
Dilution Factor: 1
Method.....: RSK SOP-175

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methane	250 B,E	0.50	ug/L

NOTE(S):

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

E Estimated result. Result concentration exceeds the calibration range.

PARSONS Engineering Science, INC.

Client Sample ID: GW004-001

GC Volatiles

Lot-Sample #...:	D9D060111-004	Work Order #...:	CTAJ3206	Matrix.....:	WG
Date Sampled...:	04/02/99 11:30	Date Received..:	04/06/99		
Prep Date.....:	04/13/99	Analysis Date..:	04/13/99		
Prep Batch #...:	9105150	Analysis Time..:	13:09		
Dilution Factor:	5				
		Method.....:	RSK SOP-175		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methane	130 B,D	2.5	ug/L

NOTE(S):

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

D Result was obtained from the analysis of a dilution.

PARSONS Engineering Science, INC.

Client Sample ID: GW006-001

GC Volatiles

Lot-Sample #...: D9D060111-007 Work Order #...: CTAJJ106 Matrix.....: WG
Date Sampled...: 04/03/99 08:00 Date Received..: 04/06/99
Prep Date.....: 04/13/99 Analysis Date..: 04/13/99
Prep Batch #...: 9105150 Analysis Time..: 11:14
Dilution Factor: 1
Method.....: RSK SOP-175

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methane	0.18 J,B	0.50	ug/L

NOTE(S):

J Estimated result. Result is less than RL.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

PARSONS Engineering Science, INC.

Client Sample ID: GW007-001

GC Volatiles

Lot-Sample #...:	D9D060111-008	Work Order #...:	CTAJQ106	Matrix.....:	WG
Date Sampled...:	04/03/99 10:00	Date Received..:	04/06/99		
Prep Date.....:	04/13/99	Analysis Date..:	04/13/99		
Prep Batch #...:	9105150	Analysis Time..:	11:19		
Dilution Factor:	1				
		Method.....:	RSK SOP-175		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methane	0.63 B	0.50	ug/L

NOTE(S):

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

PARSONS Engineering Science, INC.

Client Sample ID: GW012-001

GC Volatiles

Lot-Sample #...: D9D060111-009 Work Order #...: CTAK1106 Matrix.....: WG
Date Sampled...: 04/02/99 15:45 Date Received..: 04/06/99
Prep Date.....: 04/13/99 Analysis Date..: 04/13/99
Prep Batch #...: 9105150 Analysis Time..: 11:27
Dilution Factor: 1
Method.....: RSK SOP-175

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methane	510 B,E	0.50	ug/L

NOTE(S):

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

E Estimated result. Result concentration exceeds the calibration range.

PARSONS Engineering Science, INC.

Client Sample ID: GW012-001

GC Volatiles

Lot-Sample #...:	D9D060111-009	Work Order #...:	CTAK1206	Matrix.....:	WG
Date Sampled...:	04/02/99 15:45	Date Received..:	04/06/99		
Prep Date.....:	04/13/99	Analysis Date..:	04/13/99		
Prep Batch #...:	9105157	Analysis Time..:	16:48		
Dilution Factor:	250				
		Method.....:	RSK SOP-175		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methane	ND B,D	120	ug/L

NOTE(S):

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

D Result was obtained from the analysis of a dilution.

PARSONS Engineering Science, INC.

Client Sample ID: GW002-001

GC Volatiles

Lot-Sample #...: D9D060111-010 Work Order #...: CTAK2106 Matrix.....: WG
Date Sampled...: 04/02/99 18:30 Date Received..: 04/06/99
Prep Date.....: 04/13/99 Analysis Date..: 04/13/99
Prep Batch #...: 9105157 Analysis Time..: 13:46
Dilution Factor: 1
Method.....: RSK SOP-175

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methane	450 B,E	0.50	ug/L

NOTE(S):

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

E Estimated result. Result concentration exceeds the calibration range.

PARSONS Engineering Science, INC.

Client Sample ID: GW002-001

GC Volatiles

Lot-Sample #...:	D9D060111-010	Work Order #...:	CTAK2206	Matrix.....:	WG
Date Sampled...:	04/02/99 18:30	Date Received..:	04/06/99		
Prep Date.....:	04/13/99	Analysis Date..:	04/13/99		
Prep Batch #...:	9105157	Analysis Time..:	17:00		
Dilution Factor:	200				
		Method.....:	RSK SOP-175		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methane	ND B,D	100	ug/L

NOTE(S):

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

D Result was obtained from the analysis of a dilution.

PARSONS Engineering Science, INC.

Client Sample ID: GW003-001

GC Volatiles

Lot-Sample #...:	D9D060111-018	Work Order #...:	CTAKE106	Matrix.....:	WG
Date Sampled...:	04/02/99 19:30	Date Received..:	04/06/99		
Prep Date.....:	04/13/99	Analysis Date..:	04/13/99		
Prep Batch #...:	9105157	Analysis Time..:	13:52		
Dilution Factor:	1				
		Method.....:	RSK SOP-175		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methane	260 B,E	0.50	ug/L

NOTE(S):

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

E Estimated result. Result concentration exceeds the calibration range.

PARSONS Engineering Science, INC.

Client Sample ID: GW003-001

GC Volatiles

Lot-Sample #...: D9D060111-018 Work Order #...: CTAKE206 Matrix.....: WG
Date Sampled...: 04/02/99 19:30 Date Received..: 04/06/99
Prep Date.....: 04/13/99 Analysis Date..: 04/13/99
Prep Batch #...: 9105157 Analysis Time..: 17:12
Dilution Factor: 5
Method.....: RSK SOP-175

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methane	260 B,D	2.5	ug/L

NOTE(S):

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

D Result was obtained from the analysis of a dilution.

PARSONS Engineering Science, INC.

Client Sample ID: GW003-101

GC Volatiles

Lot-Sample #...: D9D060111-020 Work Order #...: CTAMR206 Matrix.....: WG
Date Sampled...: 04/02/99 20:00 Date Received..: 04/06/99
Prep Date.....: 04/13/99 Analysis Date..: 04/13/99
Prep Batch #...: 9105157 Analysis Time..: 13:58
Dilution Factor: 1
Method.....: RSK SOP-175

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methane	250 B,E	0.50	ug/L

NOTE(S):

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

E Estimated result. Result concentration exceeds the calibration range.

PARSONS Engineering Science, INC.

Client Sample ID: GW003-101

GC Volatiles

Lot-Sample #...:	D9D060111-020	Work Order #...:	CTAMR106	Matrix.....:	WG
Date Sampled...:	04/02/99 20:00	Date Received..:	04/06/99		
Prep Date.....:	04/13/99	Analysis Date..:	04/13/99		
Prep Batch #...:	9105157	Analysis Time..:	14:40		
Dilution Factor:	5				
		Method.....:	RSK SOP-175		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methane	210 B,D	2.5	ug/L

NOTE(S):

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

D Result was obtained from the analysis of a dilution.

PARSONS Engineering Science, INC.

Client Sample ID: GW008-001

General Chemistry

Lot-Sample #...: D9D060111-001 Work Order #...: CTAGR Matrix.....: WG
Date Sampled...: 04/03/99 12:00 Date Received..: 04/06/99

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Nitrate-Nitrite	4.8	0.10	mg/L	MCAWW 353.2	04/12/99	9102242

Dilution Factor: 1 Analysis Time..: 00:00

PARSONS Engineering Science, INC.

Client Sample ID: GW011-001

General Chemistry

Lot-Sample #...: D9D060111-002 Work Order #...: CTAHE Matrix.....: WG
Date Sampled...: 04/03/99 10:30 Date Received..: 04/06/99

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Nitrate-Nitrite	0.16	0.10	mg/L	MCAWW 353.2	04/12/99	9102242

Dilution Factor: 1 Analysis Time..: 00:00

PARSONS Engineering Science, INC.

Client Sample ID: GW009-001

General Chemistry

Lot-Sample #...: D9D060111-003 Work Order #...: CTAHP Matrix.....: WG
Date Sampled...: 04/01/99 17:20 Date Received..: 04/06/99

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Nitrate-Nitrite	0.13	0.10	mg/L	MCAWW 353.2	04/12/99	9102242

Dilution Factor: 1 Analysis Time..: 00:00

PARSONS Engineering Science, INC.

Client Sample ID: GW004-001

General Chemistry

Lot-Sample #...: D9D060111-004 Work Order #...: CTAJ3 Matrix.....: WG
Date Sampled...: 04/02/99 11:30 Date Received..: 04/06/99

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Nitrate-Nitrite	0.15	0.10	mg/L	MCAWW 353.2	04/12/99	9102242

Dilution Factor: 1 Analysis Time..: 00:00

PARSONS Engineering Science, INC.

Client Sample ID: GW006-001

General Chemistry

Lot-Sample #...: D9D060111-007 Work Order #...: CTAJJ Matrix.....: WG
Date Sampled...: 04/03/99 08:00 Date Received..: 04/06/99

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Nitrate-Nitrite	0.31	0.10	mg/L	MCAWW 353.2	04/12/99	9102242

Dilution Factor: 1 Analysis Time..: 00:00

PARSONS Engineering Science, INC.

Client Sample ID: GW007-001

General Chemistry

Lot-Sample #...: D9D060111-008 Work Order #...: CTAJQ Matrix.....: WG
Date Sampled...: 04/03/99 10:00 Date Received..: 04/06/99

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Nitrate-Nitrite	0.36	0.10	mg/L	MCAWW 353.2	04/12/99	9102242

Dilution Factor: 1 Analysis Time..: 00:00

PARSONS Engineering Science, INC.

Client Sample ID: GW012-001

General Chemistry

Lot-Sample #...: D9D060111-009 Work Order #...: CTAK1 Matrix.....: WG
Date Sampled...: 04/02/99 15:45 Date Received..: 04/06/99

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Nitrate-Nitrite	ND	0.10	mg/L	MCAWW 353.2	04/12/99	9102242

Dilution Factor: 1 Analysis Time..: 00:00

PARSONS Engineering Science, INC.

Client Sample ID: GW002-001

General Chemistry

Lot-Sample #...: D9D060111-010 Work Order #...: CTAK2 Matrix.....: WG
Date Sampled...: 04/02/99 18:30 Date Received..: 04/06/99

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Nitrate-Nitrite	ND	0.10	mg/L	MCAWW 353.2	04/12/99	9102242

Dilution Factor: 1 Analysis Time..: 00:00

PARSONS Engineering Science, INC.

Client Sample ID: SB002-002

General Chemistry

Lot-Sample #...: D9D060111-011 Work Order #...: CTAK3 Matrix.....: SO
Date Sampled...: 04/02/99 17:10 Date Received..: 04/06/99
% Moisture.....: 15

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Percent Moisture	15.0	0.10	%	ASTM D 2216-90	04/15-04/16/99	9105217
		Dilution Factor: 1		Analysis Time..: 10:55		

PARSONS Engineering Science, INC.

Client Sample ID: SB002-004

General Chemistry

Lot-Sample #...: D9D060111-012 Work Order #...: CTAK6 Matrix.....: SO
Date Sampled...: 04/02/99 17:15 Date Received..: 04/06/99
% Moisture.....: 22

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Percent Moisture	21.7	0.10	%	ASTM D 2216-90	04/15-04/16/99	9105217

Dilution Factor: 1 Analysis Time..: 10:50

PARSONS Engineering Science, INC.

Client Sample ID: SB004-002

General Chemistry

Lot-Sample #...: D9D060111-013 Work Order #...: CTAK7 Matrix.....: SO
Date Sampled...: 04/02/99 18:10 Date Received..: 04/06/99
% Moisture.....: 13

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Percent Moisture	13.0	0.10	%	ASTM D 2216-90	04/15-04/16/99	9105217

Dilution Factor: 1 Analysis Time..: 10:45

PARSONS Engineering Science, INC.

Client Sample ID: SB005-004

General Chemistry

Lot-Sample #...: D9D060111-014 Work Order #...: CTAK8 Matrix.....: SO
Date Sampled...: 04/02/99 17:40 Date Received..: 04/06/99
% Moisture.....: 17

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Percent Moisture	17.4	0.10	%	ASTM D 2216-90	04/15-04/16/99	9105217

Dilution Factor: 1 Analysis Time..: 10:43

PARSONS Engineering Science, INC.

Client Sample ID: SB008-104

General Chemistry

Lot-Sample #...: D9D060111-015 Work Order #...: CTAK9 Matrix.....: SO
Date Sampled...: 04/02/99 16:45 Date Received..: 04/06/99
% Moisture.....: 21

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Percent Moisture	21.3	0.10	%	ASTM D 2216-90	04/15-04/16/99	9105217

Dilution Factor: 1 Analysis Time..: 10:40

PARSONS Engineering Science, INC.

Client Sample ID: SB008-004

General Chemistry

Lot-Sample #...: D9D060111-016 Work Order #...: CTAKC Matrix.....: SO
Date Sampled...: 04/02/99 16:45 Date Received..: 04/06/99
% Moisture.....: 20

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Percent Moisture	20.4	0.10	%	ASTM D 2216-90	04/15-04/16/99	9105217

Dilution Factor: 1 Analysis Time..: 10:35

PARSONS Engineering Science, INC.

Client Sample ID: SB008-005

General Chemistry

Lot-Sample #...: D9D060111-017 Work Order #...: CTAKD Matrix.....: SO
Date Sampled...: 04/02/99 17:00 Date Received..: 04/06/99
% Moisture.....: 24

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Percent Moisture	24.0	0.10	%	ASTM D 2216-90	04/15-04/16/99	9105217

Dilution Factor: 1 Analysis Time..: 10:30

PARSONS Engineering Science, INC.

Client Sample ID: GW003-001

General Chemistry

Lot-Sample #...: D9D060111-018 Work Order #...: CTAKE Matrix.....: WG
Date Sampled...: 04/02/99 19:30 Date Received..: 04/06/99

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Nitrate-Nitrite	0.055 B	0.10	mg/L	MCAWW 353.2	04/12/99	9102242
	Dilution Factor: 1			Analysis Time..: 00:00		

NOTE(S):

RL Reporting Limit

B Estimated result. Result is less than RL.

PARSONS Engineering Science, INC.

Client Sample ID: GW003-101

General Chemistry

Lot-Sample #...: D9D060111-020 Work Order #...: CTAMR Matrix.....: WG
Date Sampled...: 04/02/99 20:00 Date Received..: 04/06/99

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Nitrate-Nitrite	0.080 B	0.10	mg/L	MCAWW 353.2	04/12/99	9102242

Dilution Factor: 1 Analysis Time..: 09:00

NOTE(S):

RL Reporting Limit

B Estimated result. Result is less than RL.

Chain of Custody Record

26758

Quanterra

QUA-4124

Client: Parsons ES	Project Manager: John Hix	Date: 4-5-99	Chain Of Custody Number: 49490
Address: 1700 Broadway	Telephone Number (Area Code)/Fax Number: 303-831-8100 / 8208	Lab Number: DADA00111	Page _____ of _____
City: Denver; State: CO; Zip Code: 80290	Site Contact: Lee Gorman		
Project Name: Falcon Military Gas Station	Carrier/Waybill Number:		
Contract/Purchase Order/Quote No.			

Sample I.D. No. and Description	Date	Time	Sample Type	Total Volume	Containers Type	Containers No.	Preservative	Condition on Receipt	Analysis: BTEX	MTBE	TPH 5	Methane	Naphthalene	Benzo(a)Anthracene	TPH-D	N-Hexane
074-GW008-001	4-3-99	1200	WATER	4-1 Liter	Glass		—						X	X	X	
074-GW008-001	4-3-99	↓	↓	9-40ml	↓		HCl		X	X	X	X				
074-GW008-001	4-3-99	↓	↓	1-500ml	↓		H_2SO_4									X
074-GW011-001	4-3-99	1030	WATER	4-1 Liter	Glass		—						X	X	X	
074-GW011-001	4-3-99	1030	↓	9-40ml	↓		HCl		X	X	X	X				
074-GW011-001	4-3-99	1030	↓	1-500ml	↓		H_2SO_4									X

Special Instructions

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Turn Around Time Required
☐ Normal ☒ Rush !!

QC Level
☐ I. ☐ II. ☐ III.

Project Specific (Specify)

	Date	Time
1. Relinquished By	4-5-99	AM
2. Relinquished By		
3. Relinquished By		

	Date	Time
1. Received By		
2. Received By	4/6/99	0900
3. Received By		

Comments

1 of 4

DISTRIBUTION: WHITE - Stays with Sample; CANARY - Returned to Client with Report; PINK - Field Copy

Chain of Custody Record

Quanterra

QUA-4124

Client: Parsons ES	Project Manager: John Hik	Date: 4-5-99	Chain Of Custody Number: 43491
Address: 1700 Broadway Suite 900	Telephone Number (Area Code)/Fax Number: 303-831-8100 / 8208	Lab Number: D9D060111	Page 1 of 1
City: Denver / State: Co / Zip Code: 80290	Site Contact: Lee Goorday		
Project Name: Baker Military Gas Station	Carrier/Waybill Number:		
Contract/Purchase Order/Quote No.:			

Sample I.D. No. and Description	Date	Time	Sample Type	Total Volume	Containers Type	Containers No.	Preservative	Condition on Receipt	Analysis: Naphthalene	Benzo(a)Pyrene	TPH-D	Nitrate	BTEX	MTBE	TPH-G	Methane
074-6WC09-001	4-2-99	1130	WATER	4-1 Liter	Glass		—		X	X	X					
003 074-6WC09-001	4-2-99	1130	Water	1-500ml	Glass		H_2SO_4					X				
074-6WC04-001	4-2-99	1130	water	4-1 Liter	Glass		—		X	X	X					
004 074-6WC04-001	4-2-99	1130	↓	9-Vial	↓		HCl						X	X	X	X
074-6WC04-001	4-2-99	1130		1-500ml			H_2SO_4					X				

Special Instructions:

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Turn Around Time Required: ☐ Normal ☒ Rush !!!

QC Level: ☐ I. ☐ II. ☐ III.

Project Specific (Specify):

1. Relinquished By	Date: 4-5-99	Time: AM	1. Received By	Date: 4/6/99	Time: 0900
2. Relinquished By	Date:	Time:	2. Received By	Date:	Time:
3. Relinquished By	Date:	Time:	3. Received By	Date:	Time:

Comments: 5

DISTRIBUTION: WHITE - Stays with Sample; CANARY - Returned to Client with Report; PINK - Field Copy

Chain [redacted] Custo[redacted] Record

Quanta

OUA-4124

Client: PARSONS ES	Project Manager: JOHN HIX	Date: 4-5-99	Chain Of Custody Number: 49493
Address: 1700 BROADWAY SUITE 900	Telephone Number (Area Code)/Fax Number: 303-831-8100 / 8208	Lab Number: D9D060111	Page 1 of 1
City: DENVER / State: CO / Zip Code: 80290	Site Contact: LEE GORDAY		
Project Name: ENKEN MILITARY GAS STATION	Carrier/Waybill Number:		
Contract/Purchase Order/Quote No.			

Sample I.D. No. and Description	Date	Time	Sample Type	Total Volume	Containers Type	Containers No.	Preservative	Condition on Receipt	Analysis: BTEX	Naphthalene	Benzo(a)pyrene	TPH-G	TPH-D	MTBE	TOC	Methane	Nitrate
074-GW006-001	4-3-99	0800	Water	4-1 Liter	Glass		—			X	X		X				
-007 074-GW006-001	4-3-99	0800	Water	9-40ml	↓		HCl		X			X		X		X	
074-GW006-001	4-3-99	0800	Water	1-500ml	↓		H_2SO_4										X
074-GW007-001	4-3-99	1000	Water	4-1 Liter	Glass		—			X	X		X				
-008 074-GW007-001	4-3-99	1000	↓	9-40ml	↓		HCl		X			X		X		X	
074-GW007-001	4-3-99	1000	↓	1-500ml	↓		H_2SO_4										X

Special Instructions

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Turn Around Time Required: ☐ Normal ☒ Rush

QC Level: ☐ I. ☐ II. ☐ III.

Project Specific (Specify)

1. Relinquished By	Date: 4-5-99	Time: 4pm.	1. Received By	Date: 4/6/99	Time: 0900
2. Relinquished By	Date:	Time:	2. Received By	Date:	Time:
3. Relinquished By	Date:	Time:	3. Received By	Date:	Time:

Comments

DISTRIBUTION: WHITE - Stays with Sample; CANARY - Returned to Client with Report; PINK - Field Copy

Chain of Custody Record

Quanterra

QUA-4124

Client: Parsons ES	Project Manager: John Hix	Date: 4-5-99	Chain Of Custody Number: 50445
Address: 1700 Broadway Suite 900	Telephone Number (Area Code)/Fax Number:	Lab Number: D9D060111	Page 1 of 1
City: Denver / State: CO / Zip Code: 80290	Site Contact: Lee Gorday		
Project Name: Exxon Military BAS Station	Carrier/Waybill Number:		
Contract/Purchase Order/Quote No.			

Sample I.D. No. and Description	Date	Time	Sample Type	Total Volume	Containers Type	Containers No.	Preservative	Condition on Receipt	Analysis: Naphthalene	Benzo(a)pyrene	TPH-D	BTEX	MTBE	TPH-G	Methanol	Lead
074-GW002-001	4-2-99	15:45	Water	1-4 liter	Glass		—		X	X	X					
074-GW012-001	↓	mw 4/7	↓	9-40ml	↓		HCl					X	X	X	X	
074-GW012-001				1-500ml			H_2SO_4									X
074-GW-002-001	4-2-99	18:30	Water	1-4 liter	Glass		—		X	X	X					
074-GW-002-001	↓	mw 4/7	↓	9-40ml	↓		HCl					X	X	X	X	
074-GW-002-001	↓			1-500ml	↓		H_2SO_4									X

Special Instructions

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Turn Around Time Required: ☐ Normal ☒ Rush

QC Level: ☐ I. ☐ II. ☐ III.

Project Specific (Specify)

1. Relinquished By	Date: 4-5-99	Time: Am	1. Received By	Date: 4/6/99	Time: 0900
2. Relinquished By	Date:	Time:	2. Received By	Date:	Time:
3. Relinquished By	Date:	Time:	3. Received By	Date:	Time:

Comments

DISTRIBUTION: Stays with Sample; CANARY - Returned to Client with Report; PINK - Field Copy

Chain [redacted] Custo[redacted] Record

Quanta

QUA-4124

Client: PARSONS ES	Project Manager: JOHN HICKS	Date: 4-5-99	Chain Of Custody Number: 49495
Address: 1700 BROADWAY SUITE #900	Telephone Number (Area Code)/Fax Number: 303-831-8100 / 8208	Lab Number: MDI60111	Page ____ of ____
City: DENVER	State: CO	Zip Code: 80290	Site Contact: LEE GORDNY
Project Name: EAKER MILITARY GAS STATION			Carrier/Waybill Number:
Contract/Purchase Order/Quote No.			

Sample I.D. No. and Description	Date	Time	Sample Type	Total Volume	Containers Type	Containers No.	Preservative	Condition on Receipt	Analysis: BTEX	Naphthalene	TPH-G	TPH-D	MTBE	Benzo(a) pyrene	Meth and Nitrate
11 074-SB002-002	4-2-99	17:10	~~Water~~ Soil		Sleeve		—		X	X	X	X	X	X	
12 074-SB002-004	4-2-99	17:15	~~Soil~~ Water	2 Sleeve, 1-16oz Glass			-		X	X	X	X	X		
13 074-SB004-002	4-2-99	18:10	~~Soil~~ Water	2 Sleeve, 1-16oz Glass			—		X	X	X	X	X	X	
14 074-SB005-004	4-2-99	17:40	~~Soil~~ Water						X	X	X	X	X		
15 074-SB008-104	4-2-99	16:45	Soil	2 Sleeve, 1-16oz Glass					X	X	X	X	X		
MS/MSD 16 074-SB008-004	4-2-99	16:45	Soil	↓					X	X	X	X	X		
17 074-SB008-005	4-2-99	17:00	Soil						X	X	X	X	X		
18 074-GW003-001	4-2-99	19:30	Water	4.5L + 2 40ml	Glass				X	X	X	X	X	X	X
074-GW003-101	4-2-99	20:00	Water	4.5L + 2 40ml	Glass				X	X	X	X	X	X	X
20 074-GW003-101	4-2-99		Water	9x40ml	Glass				X	X	X	X	X	X	X
074-GW003-101	4-2-99		Water	9x40ml	Glass				X	X	X	X	X	X	X

Special Instructions

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal
☐ Return To Client ☐ Disposal By Lab ☐ Archive For ____ Months

Turn Around Time Required
☐ Normal ☐ Rush

QC Level
☐ I. ☐ II. ☐ III.

Project Specific (Specify)

		Date	Time
1. Relinquished By	1. Received By	4/6/99	0900
2. Relinquished By	2. Received By		
3. Relinquished By	3. Received By		

Comments

DISTRIBUTION: WHITE - Stays with Sample; CANARY - Returned to Client with Report; PINK - Field Copy

Sample Receiving Checklist

Lot #: D9D060111 Date/Time Received: 0900 9/6/99

Company Name & Sampling Site: Parsons ES

*Cooler #(s): 1 2 3 4

Temperatures: 2.7 4.3 3.3 3.5

Unpacking & Labeling Check Points:

N/A	Yes	No		Initials
	☑	☐	1. Cooler seals intact.	MD
	☑	☐	2. Chain of custody present.	
	☑	☐	3. Bottles broken and/or are leaking, comment if yes.	
			PHOTOGRAPH BROKEN BOTTLES	
	☑	☐	4. Containers labeled, comment if no.	
	☑	☐	5. pH of all samples checked and meet requirements, note exceptions.	
	☑	☐	6. Chain of custody includes "received by" and "relinquished" by signatures, dates, and times.	
☐	☑	☐	7. Receipt date(s) > 48 hours past the collection date(s)? If yes, notify PA/PM.	
	☑	☐	8. Chain of custody agrees with bottle count, comment if no.	
	☑	☐	9. Chain of custody agrees with labels, comment if no.	
☐	☑	☐	10. VOA samples filled completely, comment if no.	
☐	☑	☐	11. VOA bottles preserved, check for labels.	
	☐	☑	12. Did samples require preservation with sodium thiosulfate?	
☐	☐	☑	13. If yes to #12, did the samples contain residual chlorine?	
☐	☐	☑	14. Sediment present in "D," dissolved, bottles.	
	☐	☑	15. Are analyses with short holding times requested?	
☐	☐	☑	16. Is extra sample volume provided for MS, MSD or matrix duplicates?	
	☐	☑	17. Multiphase samples present? If yes, comment below.	
	☐	☑	18. Any subsampling for volatiles? If yes, list samples.	
			PHOTOGRAPH MULTIPHASE SAMPLES	
☑	☐	☐	19. Clear picture taken, labeled, and stapled to project folder.	
☑	☐	☐	20. Subcontract COC signed and sent with samples to bottle prep?	
	☑	☐	21. Was sample labeling double checked by a second person?	

Document any problems or discrepancies and the actions taken to resolve them on a Condition Upon Receipt Anomaly Report (CUR)

Quanterra - Denver
Condition Upon Receipt Anomaly Report (CUR)

Client: Parsons ES
Date/Time: 4/6/99
Lot No: D9D060111
Initiated by:
COC#

Affected Samples

Client ID	Lab ID	Analyses Requested
074-GW008-001		1x40v broken for Methane
074-GW006-001		1 liter amber broken.
TB's		received but not on COC

CONDITION/ANOMALY/VARIANCE (CHECK ALL THAT APPLY):

☐COOLERS
- ☐Not Received, No Chain of Custody (COC)
- ☐Not Received but COC(s) Available
- ☐Leaking
- ☐Other:

☐ TEMPERATURE (greater than 6° C)
- ☐Cooler Temp
- ☐Temperature Blank

☒CONTAINERS
- ☐Leaking
- ☒Broken
- ☐Extra
- ☐Without Labels
- ☐VOA Vials with Headspace ____ mm
- ☐Other:

☐CUSTODY SEALS (COOLER(S)/CONTAINER(S)
- ☐None
- ☐ Not Intact
- ☐Other:

☐CHAIN OF CUSTODY (COCs)
- ☐Not relinquished by Client; No date/time Relinq.
- ☐ Incomplete Information
- ☐Other:

☐ CONTAINER LABELS
- ☐Not the same ID/info as in COC
- ☐ Incomplete
- ☐ID ☐COLLECTION ☐Time ☐Date ☐PRESERVATIVE
- ☐ Markings/Info smeared or illegible
- ☐Torn
- ☐Other:

☐ SAMPLES
- ☐Samples NOT RECEIVED but listed on COC ----- ☐will be noted on COC Client to send samples with new COC
- ☒Samples received but NOT LISTED on COC
  - ☐Logged based on Label Information
  - ☐Logged based on info from other samples on COC
  - ☐ Logged according to Work Plan
  - ☐Logged on HOLD UNTIL FURTHER NOTICE
  - ☐ Other:
- ☐ Mislabeled as to tests, preservatives, etc.
- ☐Holding time expired
- ☐ Improper container used
- ☐Not preserved / Improper preservative used
- ☐ Improper pH ____ Lab to preserve sample
- ☐ Insufficient quantities for analysis

Comments: * only 1 methane bottle, so took one from Dro-Gro-BTEX to send out!

Corrective Action:
- ☐ Client Informed: verbally on: ____ By: ____ : In writing on: ____ By: ____
- ☐ Sample(s) processed "as is".
- ☐ Sample(s) on hold until: ____ If released, notify: ____

Sample Control Supervisor Review: ____ Date: ____

Project Management Review: ____ Date: ____

SIGNED ORIGINAL MUST BE RETAINED IN THE PROJECT FILE

Quanterra Incorporated
4955 Yarrow Street
Arvada, Colorado 80002

303 421-6611 Telephone
303 431-7171 Fax

ANALYTICAL REPORT

Eaker AFB
Eaker Military Gas Station

Lot #: D9D030114

John Hicks

Parsons Engineering Services

QUANTERRA INCORPORATED

Ellen La Riviere
Project Manager

May 5, 1999

Project Narrative
(D9D030114)

With exceptions noted below and on the data sheets, standard analytical protocols were followed in the analyses of the samples and no problems were encountered or anomalies observed. All laboratory quality control samples analyzed in conjunction with the samples in this project were within acceptable limits.

Sample Receipt

One of the chains of custody received (#49464) listed the sample ID for sample D9D030114-004 as 074-MW010-100 and the other COC listed the sample ID as 074-MW010-001. The lab logged in the sample as 074-MW010-001.

The client contacted the laboratory on April 7, 1999 to cancel the total organic carbon analyses on samples D9D030114-009 (074-SB003-004), D9D030114-010 (074-SB003-006) and D9D030114-012 (074-SB001-004).

GC Semi-Volatile DRO

The Method 8015-DRO surrogate, o-terphenyl, was recovered below the lower control limit in the method blank. The secondary surrogate, octacosane, was within acceptable limits. Because all sample surrogates and other quality control samples were in control, the laboratory took no further action.

Methane by RSK-175

The methane analysis by RSK-175 was performed by Quanterra's laboratory located in Austin, Texas.

Samples D9D030114-001 through –003 were originally analyzed undiluted with methane detected at concentrations above the linear calibration range of the instrument. These results have been reported with "E flags." The samples were reanalyzed at the appropriate dilutions. Both sets of data have been reported.

EXECUTIVE SUMMARY - Detection Highlights

D9D030114

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
MW001-001 04/02/99 10:30 001				
Methane	190 B,D	2.5	ug/L	RSK SOP-175
Methane	170 B,E	0.50	ug/L	RSK SOP-175
Benzene	4.1	0.10	ug/L	SW846 8021B
Benzene	4.1	0.10	ug/L	SW846 8021B
Ethylbenzene	1.7	0.50	ug/L	SW846 8021B
Ethylbenzene	1.7	0.50	ug/L	SW846 8021B
Methyl tert-butyl ether	5.6	5.0	ug/L	SW846 8021B
Methyl tert-butyl ether	5.6	5.0	ug/L	SW846 8021B
Toluene	7.0	0.10	ug/L	SW846 8021B
Toluene	7.0	0.10	ug/L	SW846 8021B
Xylenes (total)	8.1	0.50	ug/L	SW846 8021B
Xylenes (total)	8.1	0.50	ug/L	SW846 8021B
Benzene	4.1	0.10	ug/L	SW846 8021B
Ethylbenzene	1.8	0.50	ug/L	SW846 8021B
Methyl tert-butyl ether	3.8 F	5.0	ug/L	SW846 8021B
Toluene	6.8	0.10	ug/L	SW846 8021B
Xylenes (total)	9.0	0.50	ug/L	SW846 8021B
Gasoline Range Organics	0.075 F	0.10	mg/L	SW846 8015 MOD
Nitrate-Nitrite	0.019 B	0.10	mg/L	MCAWW 353.2
MW005-001 04/01/99 15:00 002				
Diesel Range Organics	0.054 F	1.0	mg/L	SW846 8015 MOD
Methane	200 B,E	0.50	ug/L	RSK SOP-175
Methane	170 B,D	2.5	ug/L	RSK SOP-175
Gasoline Range Organics	0.079 F	0.10	mg/L	SW846 8015 MOD
Nitrate-Nitrite	0.048 B	0.10	mg/L	MCAWW 353.2
MW005-101 04/01/99 15:40 003				
Diesel Range Organics	0.044 F	1.0	mg/L	SW846 8015 MOD
Methane	210 B,E	0.50	ug/L	RSK SOP-175
Methane	210 B,D	2.5	ug/L	RSK SOP-175
Gasoline Range Organics	0.072 F	0.10	mg/L	SW846 8015 MOD
Nitrate-Nitrite	0.030 B	0.10	mg/L	MCAWW 353.2
MW010-001 04/01/99 16:15 004				
Methane	4.7 B	0.50	ug/L	RSK SOP-175
Gasoline Range Organics	0.0045 F	0.10	mg/L	SW846 8015 MOD
Nitrate-Nitrite	1.1	0.10	mg/L	MCAWW 353.2

(Continued on next page)

EXECUTIVE SUMMARY - Detection Highlights

D9D030114

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
MW009-004 03/31/99 16:30 006				
Total Organic Carbon	960 B	2000	mg/kg	SW846 9060
Percent Moisture	22.2	0.10	%	MCAWW 160.3 MOD
MW011-004 03/31/99 17:00 007				
Total Organic Carbon	1760 B	2000	mg/kg	SW846 9060
Percent Moisture	19.6	0.10	%	MCAWW 160.3 MOD
SB003-002 04/01/99 08:00 008				
Percent Moisture	21.3	0.10	%	MCAWW 160.3 MOD
SB003-004 04/01/99 08:15 009				
Diesel Range Organics	13	13	mg/kg	SW846 8015 MOD
Benzene	7.5	3.2	mg/kg	SW846 8021B
Benzene	7.5	3.2	mg/kg	SW846 8021B
Benzene	9.1	3.2	mg/kg	SW846 8021B
Ethylbenzene	23	3.2	mg/kg	SW846 8021B
Ethylbenzene	23	3.2	mg/kg	SW846 8021B
Ethylbenzene	23	3.2	mg/kg	SW846 8021B
Toluene	65	3.2	mg/kg	SW846 8021B
Toluene	65	3.2	mg/kg	SW846 8021B
Toluene	70	3.2	mg/kg	SW846 8021B
Xylenes (total)	120	3.2	mg/kg	SW846 8021B
Xylenes (total)	120	3.2	mg/kg	SW846 8021B
Xylenes (total)	130	3.2	mg/kg	SW846 8021B
Gasoline Range Organics	1400	64	mg/kg	SW846 8015 MOD
Naphthalene	3800	260	ug/kg	SW846 8310
Naphthalene	3800	260	ug/kg	SW846 8310
Naphthalene	3200	260	ug/kg	SW846 8310
Percent Moisture	21.7	0.10	%	MCAWW 160.3 MOD
SB003-006 04/01/99 08:25 010				
Diesel Range Organics	13	13	mg/kg	SW846 8015 MOD
Benzene	4.2	1.3	mg/kg	SW846 8021B
Benzene	4.2	1.3	mg/kg	SW846 8021B
Benzene	4.9	1.3	mg/kg	SW846 8021B
Ethylbenzene	6.7	1.3	mg/kg	SW846 8021B
Ethylbenzene	6.7	1.3	mg/kg	SW846 8021B
Ethylbenzene	6.9	1.3	mg/kg	SW846 8021B
Toluene	21	1.3	mg/kg	SW846 8021B

(Continued on next page)

EXECUTIVE SUMMARY - Detection Highlights

D9D030114

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
SB003-006 04/01/99 08:25 010				
Toluene	21	1.3	mg/kg	SW846 8021B
Toluene	23	1.3	mg/kg	SW846 8021B
Xylenes (total)	35	1.3	mg/kg	SW846 8021B
Xylenes (total)	35	1.3	mg/kg	SW846 8021B
Xylenes (total)	39	1.3	mg/kg	SW846 8021B
Gasoline Range Organics	490	26	mg/kg	SW846 8015 MOD
Naphthalene	1500	260	ug/kg	SW846 8310
Naphthalene	1500	260	ug/kg	SW846 8310
Naphthalene	1200	260	ug/kg	SW846 8310
Percent Moisture	24.0	0.10	%	MCAWW 160.3 MOD
SB001-004 04/01/99 09:15 012				
Diesel Range Organics	26	12	mg/kg	SW846 8015 MOD
Benzene	0.046 F	0.062	mg/kg	SW846 8021B
Benzene	0.046 F	0.062	mg/kg	SW846 8021B
Benzene	0.049 F	0.062	mg/kg	SW846 8021B
Gasoline Range Organics	2.8	1.2	mg/kg	SW846 8015 MOD
Percent Moisture	19.6	0.10	%	MCAWW 160.3 MOD
SB001-006 04/01/99 09:25 013				
Gasoline Range Organics	32	1.4	mg/kg	SW846 8015 MOD
Total Organic Carbon	1360 B	2000	mg/kg	SW846 9060
Percent Moisture	27.7	0.10	%	MCAWW 160.3 MOD
MW009-001 04/01/99 17:20 014				
Methane	1.2 B	0.50	ug/L	RSK SOP-175
Gasoline Range Organics	0.0051 F	0.10	mg/L	SW846 8015 MOD
SB001-002 04/01/99 09:05 015				
Percent Moisture	16.2	0.10	%	MCAWW 160.3 MOD

METHODS SUMMARY

D9D030114

PARAMETER	ANALYTICAL METHOD	PREPARATION METHOD
Dissolved Gasses in Water	RSK SOP-175	EPA-9 RSK-175
Extractable Petroleum Hydrocarbons	SW846 8015 MOD	SW846 3510
Extractable Petroleum Hydrocarbons	SW846 8015 MOD	SW846 3550
Nitrate-Nitrite	MCAWW 353.2	MCAWW 353.2
Percent Moisture	MCAWW 160.3 MOD	MCAWW 160.3 MOD
Polynuclear Aromatic Hydrocarbons by HPLC	SW846 8310	SW846 3510
Polynuclear Aromatic Hydrocarbons by HPLC	SW846 8310	SW846 3550
Total Organic Carbon	SW846 9060	SW846 9060
Volatile Petroleum Hydrocarbons	SW846 8015 MOD	SW846 5030
Volatiles by GC	SW846 8021B	SW846 5030
Volatiles by GC	SW846 8021B	SW846 5035

References:

MCAWW "Methods for Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983 and subsequent revisions.

RSK Sample Prep and Calculations for Dissolved Gas Analysis in Water Samples Using a GC Headspace Equilibration Technique, RSKSOP-175, REV. 0, 8/11/94, USEPA Research Lab

SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

SAMPLE SUMMARY

D9D030114

WO #	SAMPLE#	CLIENT SAMPLE ID	DATE	TIME
CT9A3	001	MW001-001	04/02/99	10:30
CT9C6	002	MW005-001	04/01/99	15:00
CT9C7	003	MW005-101	04/01/99	15:40
CT9C8	004	MW010-001	04/01/99	16:15
CT9C9	005	TB001	04/01/99	
CT9CQ	006	MW009-004	03/31/99	16:30
CT9CR	007	MW011-004	03/31/99	17:00
CT9CT	008	SB003-002	04/01/99	08:00
CT9CV	009	SB003-004	04/01/99	08:15
CT9CW	010	SB003-006	04/01/99	08:25
CT9D0	012	SB001-004	04/01/99	09:15
CT9D3	013	SB001-006	04/01/99	09:25
CT9D7	014	MW009-001	04/01/99	17:20
CT9DG	015	SB001-002	04/01/99	09:05

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.

Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

PARSONS Engineering Science, INC.

Client Sample ID: MW001-001

GC Volatiles

Lot-Sample #...: D9D030114-001 Work Order #...: CT9A3103 Matrix.....: WG
Date Sampled...: 04/02/99 10:30 Date Received..: 04/03/99
Prep Date.....: 04/15/99 Analysis Date..: 04/15/99
Prep Batch #...: 9113128 Analysis Time..: 13:24
Dilution Factor: 1
Method.....: SW846 8021B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	4.1	0.10	ug/L
Ethylbenzene	1.7	0.50	ug/L
Methyl tert-butyl ether	5.6	5.0	ug/L
Toluene	7.0	0.10	ug/L
Xylenes (total)	8.1	0.50	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	100	(82 - 112)
Fluorobenzene	98	(44 - 165)

NOTE(S):
1C

PARSONS Engineering Science, INC.

Client Sample ID: **MW001-001**

GC Volatiles

Lot-Sample #...:	D9D030114-001	Work Order #...:	CT9A310T	Matrix.....:	WG
Date Sampled...:	04/02/99 10:30	Date Received..:	04/03/99		
Prep Date.....:	04/15/99	Analysis Date..:	04/15/99		
Prep Batch #...:	9113128	Analysis Time..:	13:24		
Dilution Factor:	1				
		Method.....:	SW846 8021B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	4.1	0.10	ug/L
Ethylbenzene	1.8	0.50	ug/L
Methyl tert-butyl ether	3.8 F	5.0	ug/L
Toluene	6.8	0.10	ug/L
Xylenes (total)	9.0	0.50	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	103	(82 - 112)
Fluorobenzene	99	(44 - 165)

NOTE(S):

F The analyte was identified but the value was below the RL and above the MDL.

2C

PARSONS Engineering Science, INC.

Client Sample ID: MW001-001

GC Volatiles

Lot-Sample #...: D9D030114-001	Work Order #...: CT9A310M	Matrix.....: WG	
Date Sampled...: 04/02/99 10:30	Date Received..: 04/03/99		
Prep Date.....: 04/13/99	Analysis Date..: 04/13/99		
Prep Batch #...: 9106313	Analysis Time..: 13:55		
Dilution Factor: 1			
	Method.....: SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	0.075 F	0.10	mg/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	95	(74 - 138)

NOTE(S):

F The analyte was identified but the value was below the RL and above the MDL.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

PARSONS Engineering Science, INC.

Client Sample ID: MW005-001

GC Volatiles

Lot-Sample #...: D9D030114-002 Work Order #...: CT9C6103 Matrix.....: WG
Date Sampled...: 04/01/99 15:00 Date Received..: 04/03/99
Prep Date.....: 04/15/99 Analysis Date..: 04/15/99
Prep Batch #...: 9113128 Analysis Time..: 15:12
Dilution Factor: 1
Method.....: SW846 8021B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	ND	0.10	ug/L
Ethylbenzene	ND	0.50	ug/L
Methyl tert-butyl ether	ND	5.0	ug/L
Toluene	ND	0.10	ug/L
Xylenes (total)	ND	0.50	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	97	(82 - 112)
Fluorobenzene	95	(44 - 165)

PARSONS Engineering Science, INC.

Client Sample ID: MW005-001

GC Volatiles

Lot-Sample #...:	D9D030114-002	Work Order #...:	CT9C6108	Matrix.....:	WG
Date Sampled...:	04/01/99 15:00	Date Received..:	04/03/99		
Prep Date.....:	04/13/99	Analysis Date..:	04/13/99		
Prep Batch #...:	9106313	Analysis Time..:	16:09		
Dilution Factor:	1				
		Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	0.079 F	0.10	mg/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	108	(74 - 138)

NOTE(S):

F The analyte was identified but the value was below the RL and above the MDL.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

PARSONS Engineering Science, INC.

Client Sample ID: **MW005-101**

GC Volatiles

Lot-Sample #...: D9D030114-003 **Work Order #...:** CT9C7103 **Matrix.....:** WG
Date Sampled...: 04/01/99 15:40 **Date Received..:** 04/03/99
Prep Date.....: 04/15/99 **Analysis Date..:** 04/15/99
Prep Batch #...: 9113128 **Analysis Time..:** 15:48
Dilution Factor: 1

Method.....: SW846 8021B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	ND	0.10	ug/L
Ethylbenzene	ND	0.50	ug/L
Methyl tert-butyl ether	ND	5.0	ug/L
Toluene	ND	0.10	ug/L
Xylenes (total)	ND	0.50	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	101	(82 - 112)
Fluorobenzene	99	(44 - 165)

PARSONS Engineering Science, INC.

Client Sample ID: MW005-101

GC Volatiles

Lot-Sample #...:	D9D030114-003	Work Order #...:	CT9C7108	Matrix.....:	WG
Date Sampled...:	04/01/99 15:40	Date Received..:	04/03/99		
Prep Date.....:	04/13/99	Analysis Date..:	04/13/99		
Prep Batch #...:	9106313	Analysis Time..:	16:54		
Dilution Factor:	1				
		Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	0.072 F	0.10	mg/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	106	(74 - 138)

NOTE(S):

F The analyte was identified but the value was below the RL and above the MDL.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

PARSONS Engineering Science, INC.

Client Sample ID: MW010-001

GC Volatiles

Lot-Sample #...: D9D030114-004 Work Order #...: CT9C8103 Matrix.....: WG
Date Sampled...: 04/01/99 16:15 Date Received..: 04/03/99
Prep Date.....: 04/15/99 Analysis Date..: 04/15/99
Prep Batch #...: 9113128 Analysis Time..: 16:24
Dilution Factor: 1

Method.....: SW846 8021B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	ND	0.10	ug/L
Ethylbenzene	ND	0.50	ug/L
Methyl tert-butyl ether	ND	5.0	ug/L
Toluene	ND	0.10	ug/L
Xylenes (total)	ND	0.50	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	101	(82 - 112)
Fluorobenzene	99	(44 - 165)

PARSONS Engineering Science, INC.

Client Sample ID: MW010-001

GC Volatiles

Lot-Sample #...: D9D030114-004 Work Order #...: CT9C8108 Matrix.....: WG
Date Sampled...: 04/01/99 16:15 Date Received..: 04/03/99
Prep Date.....: 04/13/99 Analysis Date..: 04/13/99
Prep Batch #...: 9106313 Analysis Time..: 17:39
Dilution Factor: 1
Method.....: SW846 8015 MOD

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	0.0045 F	0.10	mg/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	100	(74 - 138)

NOTE(S):

F The analyte was identified but the value was below the RL and above the MDL.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

PARSONS Engineering Science, INC.

Client Sample ID: TB001

GC Volatiles

Lot-Sample #...: D9D030114-005 Work Order #...: CT9C9101 Matrix.....: WQ
Date Sampled...: 04/01/99 Date Received..: 04/03/99
Prep Date.....: 04/15/99 Analysis Date..: 04/15/99
Prep Batch #...: 9113128 Analysis Time..: 16:59
Dilution Factor: 1

Method.....: SW846 8021B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	ND	0.10	ug/L
Ethylbenzene	ND	0.50	ug/L
Toluene	ND	0.10	ug/L
Xylenes (total)	ND	0.50	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	103	(82 - 112)
Fluorobenzene	101	(44 - 165)

PARSONS Engineering Science, INC.

Client Sample ID: SB003-002

GC Volatiles

Lot-Sample #...:	D9D030114-008	**Work Order #...:**	CT9CT102	**Matrix.....:**	SO
Date Sampled...:	04/01/99 08:00	**Date Received..:**	04/03/99		
Prep Date.....:	04/07/99	**Analysis Date..:**	04/15/99		
Prep Batch #...:	9113151	**Analysis Time..:**	19:57		
Dilution Factor:	100				
% Moisture.....:	21	**Method.....:**	SW846 8021B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methyl tert-butyl ether	ND	6.4	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	0.0 DIL	(77 - 118)
Fluorobenzene	0.0 DIL	(34 - 175)

NOTE(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

Results and reporting limits have been adjusted for dry weight.

PARSONS Engineering Science, INC.

Client Sample ID: SB003-004

GC Volatiles

Lot-Sample #...: D9D030114-009 Work Order #...: CT9CV104 Matrix.....: SO
Date Sampled...: 04/01/99 08:15 Date Received..: 04/03/99
Prep Date.....: 04/07/99 Analysis Date..: 04/15/99
Prep Batch #...: 9113151 Analysis Time..: 20:33
Dilution Factor: 50
% Moisture.....: 22 Method.....: SW846 8021B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methyl tert-butyl ether	ND	3.2	mg/kg
Benzene	7.5	3.2	mg/kg
Ethylbenzene	23	3.2	mg/kg
Toluene	65	3.2	mg/kg
Xylenes (total)	120	3.2	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	0.0 DIL	(77 - 118)
Fluorobenzene	0.0 DIL	(34 - 175)

NOTE(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

Results and reporting limits have been adjusted for dry weight.

PARSONS Engineering Science, INC.

Client Sample ID: SB003-004

GC Volatiles

Lot-Sample #...:	D9D030114-009	**Work Order #...:**	CT9CV109	**Matrix.....:**	SO
Date Sampled...:	04/01/99 08:15	**Date Received..:**	04/03/99		
Prep Date.....:	04/07/99	**Analysis Date..:**	04/15/99		
Prep Batch #...:	9113151	**Analysis Time..:**	20:33		
Dilution Factor:	50				
% Moisture.....:	22	**Method.....:**	SW846 8021B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methyl tert-butyl ether	ND	3.2	mg/kg
Benzene	**9.1**	**3.2**	**mg/kg**
Ethylbenzene	**23**	**3.2**	**mg/kg**
Toluene	**70**	**3.2**	**mg/kg**
Xylenes (total)	**130**	**3.2**	**mg/kg**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	0.0 DIL	(77 - 118)
Fluorobenzene	0.0 DIL	(34 - 175)

NOTE(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

Results and reporting limits have been adjusted for dry weight.

2C

PARSONS Engineering Science, INC.

Client Sample ID: SB003-004

GC Volatiles

Lot-Sample #...: D9D030114-009 Work Order #...: CT9CV107 Matrix.....: SO
Date Sampled...: 04/01/99 08:15 Date Received..: 04/03/99
Prep Date.....: 04/07/99 Analysis Date..: 04/12/99
Prep Batch #...: 9106281 Analysis Time..: 12:45
Dilution Factor: 50
% Moisture.....: 22 Method.....: SW846 8015 MOD

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	1400	64	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	0.0 DIL	(64 - 148)

NOTE(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics that are similar to gasoline.

PARSONS Engineering Science, INC.

Client Sample ID: SB003-006

GC Volatiles

Lot-Sample #...:	D9D030114-010	**Work Order #...:**	CT9CW104	**Matrix.....:**	SO
Date Sampled...:	04/01/99 08:25	**Date Received..:**	04/03/99		
Prep Date.....:	04/07/99	**Analysis Date..:**	04/15/99		
Prep Batch #...:	9113151	**Analysis Time..:**	21:09		
Dilution Factor:	20				
% Moisture.....:	24	**Method.....:**	SW846 8021B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methyl tert-butyl ether	ND	1.3	mg/kg
Benzene	**4.2**	**1.3**	**mg/kg**
Ethylbenzene	**6.7**	**1.3**	**mg/kg**
Toluene	**21**	**1.3**	**mg/kg**
Xylenes (total)	**35**	**1.3**	**mg/kg**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	0.0 DIL	(77 - 118)
Fluorobenzene	0.0 DIL	(34 - 175)

NOTE(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

Results and reporting limits have been adjusted for dry weight.

1C

PARSONS Engineering Science, INC.

Client Sample ID: SB003-006

GC Volatiles

Lot-Sample #...: D9D030114-010 Work Order #...: CT9CW109 Matrix.....: SO
Date Sampled...: 04/01/99 08:25 Date Received..: 04/03/99
Prep Date.....: 04/07/99 Analysis Date..: 04/15/99
Prep Batch #...: 9113151 Analysis Time..: 21:09
Dilution Factor: 20
% Moisture.....: 24 Method.....: SW846 8021B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methyl tert-butyl ether	ND	1.3	mg/kg
Benzene	4.9	1.3	mg/kg
Ethylbenzene	6.9	1.3	mg/kg
Toluene	23	1.3	mg/kg
Xylenes (total)	39	1.3	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	0.0 DIL	(77 - 118)
Fluorobenzene	0.0 DIL	(34 - 175)

NOTE(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

Results and reporting limits have been adjusted for dry weight.

PARSONS Engineering Science, INC.

Client Sample ID: SB003-006

GC Volatiles

Lot-Sample #...:	D9D030114-010	Work Order #...:	CT9CW107	Matrix.....:	SO
Date Sampled...:	04/01/99 08:25	Date Received..:	04/03/99		
Prep Date.....:	04/07/99	Analysis Date..:	04/12/99		
Prep Batch #...:	9106281	Analysis Time..:	13:29		
Dilution Factor:	20				
% Moisture.....:	24	Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	490	26	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	0.0 DIL	(64 - 148)

NOTE(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics that are similar to gasoline.

PARSONS Engineering Science, INC.

Client Sample ID: SB001-004

GC Volatiles

Lot-Sample #...: D9D030114-012 Work Order #...: CT9D0104 Matrix.....: SO
Date Sampled...: 04/01/99 09:15 Date Received..: 04/03/99
Prep Date.....: 04/07/99 Analysis Date..: 04/15/99
Prep Batch #...: 9113151 Analysis Time..: 21:45
Dilution Factor: 1
% Moisture.....: 20 Method.....: SW846 8021B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methyl tert-butyl ether	ND	0.062	mg/kg
Benzene	**0.046 F**	**0.062**	**mg/kg**
Ethylbenzene	ND	0.062	mg/kg
Toluene	ND	0.062	mg/kg
Xylenes (total)	ND	0.062	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	82	(77 - 118)
Fluorobenzene	120	(34 - 175)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

F The analyte was identified but the value was below the RL and above the MDL.

PARSONS Engineering Science, INC.

Client Sample ID: SB001-004

GC Volatiles

Lot-Sample #...:	D9D030114-012	**Work Order #...:**	CT9D0108	**Matrix.....:**	SO
Date Sampled...:	04/01/99 09:15	**Date Received..:**	04/03/99		
Prep Date.....:	04/07/99	**Analysis Date..:**	04/15/99		
Prep Batch #...:	9113151	**Analysis Time..:**	21:45		
Dilution Factor:	1				
% Moisture.....:	20	**Method.....:**	SW846 8021B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methyl tert-butyl ether	ND	0.062	mg/kg
Benzene	**0.049 F**	**0.062**	**mg/kg**
Ethylbenzene	ND	0.062	mg/kg
Toluene	ND	0.062	mg/kg
Xylenes (total)	ND	0.062	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	82	(77 - 118)
Fluorobenzene	122	(34 - 175)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

F The analyte was identified but the value was below the RL and above the MDL.

2C

PARSONS Engineering Science, INC.

Client Sample ID: SB001-004

GC Volatiles

Lot-Sample #...:	D9D030114-012	Work Order #...:	CT9D0107	Matrix.....:	SO
Date Sampled...:	04/01/99 09:15	Date Received..:	04/03/99		
Prep Date.....:	04/07/99	Analysis Date..:	04/12/99		
Prep Batch #...:	9106281	Analysis Time..:	14:14		
Dilution Factor:	1				
% Moisture.....:	20	Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	2.8	1.2	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	85	(64 - 148)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

PARSONS Engineering Science, INC.

Client Sample ID: SB001-006

GC Volatiles

Lot-Sample #...: D9D030114-013	**Work Order #...:** CT9D3104	**Matrix.....:** SO	
Date Sampled...: 04/01/99 09:25	**Date Received..:** 04/03/99		
Prep Date.....: 04/07/99	**Analysis Date..:** 04/15/99		
Prep Batch #...: 9113151	**Analysis Time..:** 22:21		
Dilution Factor: 1			
% Moisture.....: 28	**Method.....:** SW846 8021B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methyl tert-butyl ether	ND	0.069	mg/kg
Benzene	ND	0.069	mg/kg
Ethylbenzene	ND	0.069	mg/kg
Toluene	ND	0.069	mg/kg
Xylenes (total)	ND	0.069	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	90	(77 - 118)
Fluorobenzene	98	(34 - 175)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

PARSONS Engineering Science, INC.

Client Sample ID: SB001-006

GC Volatiles

Lot-Sample #...:	D9D030114-013	Work Order #...:	CT9D3108
Date Sampled...:	04/01/99 09:25	Date Received..:	04/03/99
Prep Date.....:	04/07/99	Analysis Date..:	04/12/99
Prep Batch #...:	9106281	Analysis Time..:	14:59
Dilution Factor:	1		
% Moisture.....:	28	Method.....:	SW846 8015 MOD

Matrix.....: SO

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	32	1.4	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	120	(64 - 148)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics that are similar to weathered gasoline.

PARSONS Engineering Science, INC.

Client Sample ID: MW009-001

GC Volatiles

Lot-Sample #...: D9D030114-014 Work Order #...: CT9D7102 Matrix.....: WG
Date Sampled...: 04/01/99 17:20 Date Received..: 04/03/99
Prep Date.....: 04/15/99 Analysis Date..: 04/15/99
Prep Batch #...: 9113128 Analysis Time..: 17:35
Dilution Factor: 1
Method.....: SW846 8021B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	ND	0.10	ug/L
Ethylbenzene	ND	0.50	ug/L
Methyl tert-butyl ether	ND	5.0	ug/L
Toluene	ND	0.10	ug/L
Xylenes (total)	ND	0.50	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	106	(82 - 112)
Fluorobenzene	103	(44 - 165)

PARSONS Engineering Science, INC.

Client Sample ID: MW009-001

GC Volatiles

Lot-Sample #...: D9D030114-014 Work Order #...: CT9D7104 Matrix.....: WG
Date Sampled...: 04/01/99 17:20 Date Received..: 04/03/99
Prep Date.....: 04/13/99 Analysis Date..: 04/13/99
Prep Batch #...: 9106313 Analysis Time..: 18:23
Dilution Factor: 1

Method.....: SW846 8015 MOD

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	0.0051 F	0.10	mg/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	95	(74 - 138)

NOTE(S):

F The analyte was identified but the value was below the RL and above the MDL.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

PARSONS Engineering Science, INC.

Client Sample ID: SB001-002

GC Volatiles

Lot-Sample #...:	D9D030114-015	**Work Order #...:**	CT9DG102	**Matrix.....:**	SO
Date Sampled...:	04/01/99 09:05	**Date Received..:**	04/03/99		
Prep Date.....:	04/07/99	**Analysis Date..:**	04/15/99		
Prep Batch #...:	9113151	**Analysis Time..:**	22:57		
Dilution Factor:	1				
% Moisture.....:	16	**Method.....:**	SW846 8021B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methyl tert-butyl ether	ND	0.060	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	107	(77 - 118)
Fluorobenzene	104	(34 - 175)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

PARSONS Engineering Science, INC.

Client Sample ID: MW001-001

GC Semivolatiles

Lot-Sample #...: D9D030114-001 Work Order #...: CT9A310L Matrix.....: WG
Date Sampled...: 04/02/99 10:30 Date Received..: 04/03/99
Prep Date.....: 04/06/99 Analysis Date..: 04/16/99
Prep Batch #...: 9099171 Analysis Time..: 18:35
Dilution Factor: 1
Method.....: SW846 8015 MOD

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	ND	1.0	mg/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	78	(57 - 132)
n-Octacosane	69	(26 - 152)

PARSONS Engineering Science, INC.

Client Sample ID: MW005-001

GC Semivolatiles

Lot-Sample #...: D9D030114-002	Work Order #...: CT9C6107	Matrix.....: WG	
Date Sampled...: 04/01/99 15:00	Date Received..: 04/03/99		
Prep Date.....: 04/06/99	Analysis Date..: 04/16/99		
Prep Batch #...: 9099171	Analysis Time..: 20:28		
Dilution Factor: 1			
	Method.....: SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	0.054 F	1.0	mg/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	80	(57 - 132)
n-Octacosane	100	(26 - 152)

NOTE(S):

F The analyte was identified but the value was below the RL and above the MDL.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

Sample resembles a hydrocarbon product occurring within the n-alkane range of C10 to C28.

PARSONS Engineering Science, INC.

Client Sample ID: MW005-101

GC Semivolatiles

Lot-Sample #...: D9D030114-003 Work Order #...: CT9C7107 Matrix.....: WG
Date Sampled...: 04/01/99 15:40 Date Received..: 04/03/99
Prep Date.....: 04/06/99 Analysis Date..: 04/16/99
Prep Batch #...: 9099171 Analysis Time..: 21:06
Dilution Factor: 1
Method.....: SW846 8015 MOD

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	0.044 F	1.0	mg/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	76	(57 - 132)
n-Octacosane	90	(26 - 152)

NOTE(S):

F The analyte was identified but the value was below the RL and above the MDL.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

Sample resembles a hydrocarbon product occurring within the n-alkane range of C10 to C28.

PARSONS Engineering Science, INC.

Client Sample ID: MW010-001

GC Semivolatiles

Lot-Sample #...: D9D030114-004	**Work Order #...:** CT9C8107	**Matrix.....:** WG	
Date Sampled...: 04/01/99 16:15	**Date Received..:** 04/03/99		
Prep Date.....: 04/06/99	**Analysis Date..:** 04/16/99		
Prep Batch #...: 9099171	**Analysis Time..:** 21:43		
Dilution Factor: 1			
	Method.....: SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	ND	1.0	mg/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	78	(57 - 132)
n-Octacosane	92	(26 - 152)

PARSONS Engineering Science, INC.

Client Sample ID: SB003-004

GC Semivolatiles

Lot-Sample #...:	D9D030114-009	Work Order #...:	CT9CV106	Matrix.....:	SO
Date Sampled...:	04/01/99 08:15	Date Received..:	04/03/99		
Prep Date.....:	04/08/99	Analysis Date..:	04/17/99		
Prep Batch #...:	9098207	Analysis Time..:	10:53		
Dilution Factor:	1				
% Moisture.....:	22	Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	13	13	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	82	(47 - 142)
n-Octacosane	104	(25 - 162)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

Sample resembles a hydrocarbon product occurring within the n-alkane range of C10 to C28.

PARSONS Engineering Science, INC.

Client Sample ID: SB003-006

GC Semivolatiles

Lot-Sample #...: D9D030114-010	Work Order #...: CT9CW106	Matrix.....: SO	
Date Sampled...: 04/01/99 08:25	Date Received..: 04/03/99		
Prep Date.....: 04/08/99	Analysis Date..: 04/17/99		
Prep Batch #...: 9098207	Analysis Time..: 11:31		
Dilution Factor: 1			
% Moisture.....: 24	Method.....: SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	13	13	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	82	(47 - 142)
n-Octacosane	109	(25 - 162)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

Sample resembles a hydrocarbon product occurring within the n-alkane range of C10 to C28.

PARSONS Engineering Science, INC.

Client Sample ID: SB001-004

GC Semivolatiles

Lot-Sample #...: D9D030114-012	Work Order #...: CT9D0106	Matrix.....: SO	
Date Sampled...: 04/01/99 09:15	Date Received..: 04/03/99		
Prep Date.....: 04/08/99	Analysis Date..: 04/17/99		
Prep Batch #...: 9098207	Analysis Time..: 12:09		
Dilution Factor: 1			
% Moisture.....: 20	Method.....: SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	26	12	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	81	(47 - 142)
n-Octacosane	111	(25 - 162)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

Sample resembles a hydrocarbon product occurring within the n-alkane range of C10 to C28.

PARSONS Engineering Science, INC.

Client Sample ID: SB001-006

GC Semivolatiles

Lot-Sample #...: D9D030114-013	**Work Order #...:** CT9D3107	**Matrix.....:** SO	
Date Sampled...: 04/01/99 09:25	**Date Received..:** 04/03/99		
Prep Date.....: 04/08/99	**Analysis Date..:** 04/17/99		
Prep Batch #...: 9098207	**Analysis Time..:** 12:47		
Dilution Factor: 1			
% Moisture.....: 28	**Method.....:** SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	ND	14	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	76	(47 - 142)
n-Octacosane	93	(25 - 162)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

PARSONS Engineering Science, INC.

Client Sample ID: MW001-001

HPLC

Lot-Sample #...: D9D030114-001	Work Order #...: CT9A3104	Matrix.....: WG	
Date Sampled...: 04/02/99 10:30	Date Received..: 04/03/99		
Prep Date.....: 04/05/99	Analysis Date..: 04/13/99		
Prep Batch #...: 9095158	Analysis Time..: 22:15		
Dilution Factor: 1			
	Method.....: SW846 8310		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzo(a)pyrene	ND	0.10	ug/L
Naphthalene	ND	1.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Terphenyl-d14	61	(25 - 157)

PARSONS Engineering Science, INC.

Client Sample ID: MW005-001

HPLC

Lot-Sample #...: D9D030114-002	**Work Order #...:** CT9C6104	**Matrix.....:** WG	
Date Sampled...: 04/01/99 15:00	**Date Received..:** 04/03/99		
Prep Date.....: 04/05/99	**Analysis Date..:** 04/14/99		
Prep Batch #...: 9095158	**Analysis Time..:** 00:14		
Dilution Factor: 1			
	Method.....: SW846 8310		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzo(a)pyrene	ND	0.10	ug/L
Naphthalene	ND	1.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Terphenyl-d14	62	(25 - 157)

PARSONS Engineering Science, INC.

Client Sample ID: MW005-101

HPLC

Lot-Sample #...:	D9D030114-003	Work Order #...:	CT9C7104	Matrix.....:	WG
Date Sampled...:	04/01/99 15:40	Date Received..:	04/03/99		
Prep Date.....:	04/05/99	Analysis Date..:	04/14/99		
Prep Batch #...:	9095158	Analysis Time..:	00:44		
Dilution Factor:	1				
		Method.....:	SW846 8310		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzo(a)pyrene	ND	0.10	ug/L
Naphthalene	ND	1.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Terphenyl-d14	61	(25 - 157)

PARSONS Engineering Science, INC.

Client Sample ID: MW010-001

HPLC

Lot-Sample #...:	D9D030114-004	**Work Order #...:**	CT9C8104	**Matrix.....:**	WG
Date Sampled...:	04/01/99 16:15	**Date Received..:**	04/03/99		
Prep Date.....:	04/05/99	**Analysis Date..:**	04/14/99		
Prep Batch #...:	9095158	**Analysis Time..:**	01:14		
Dilution Factor:	1				
		Method.....:	SW846 8310		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzo(a)pyrene	ND	0.10	ug/L
Naphthalene	ND	1.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Terphenyl-d14	61	(25 - 157)

PARSONS Engineering Science, INC.

Client Sample ID: SB003-004

HPLC

Lot-Sample #...:	D9D030114-009	Work Order #...:	CT9CV105	Matrix.....:	SO
Date Sampled...:	04/01/99 08:15	Date Received..:	04/03/99		
Prep Date.....:	04/08/99	Analysis Date..:	04/15/99		
Prep Batch #...:	9097380	Analysis Time..:	06:04		
Dilution Factor:	1				
% Moisture.....:	22	Method.....:	SW846 8310		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzo(a)pyrene	ND	26	ug/kg
Naphthalene	**3800**	**260**	**ug/kg**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Terphenyl-d14	67	(22 - 167)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

1C

PARSONS Engineering Science, INC.

Client Sample ID: SB003-004

HPLC

Lot-Sample #...:	D9D030114-009	**Work Order #...:**	CT9CV108	**Matrix.....:**	SO
Date Sampled...:	04/01/99 08:15	**Date Received..:**	04/03/99		
Prep Date.....:	04/08/99	**Analysis Date..:**	04/15/99		
Prep Batch #...:	9097380	**Analysis Time..:**	06:04		
Dilution Factor:	1				
% Moisture.....:	22	**Method.....:**	SW846 8310		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzo(a)pyrene	ND	26	ug/kg
Naphthalene	**3200**	**260**	**ug/kg**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Terphenyl-d14	77	(22 - 167)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

2C

PARSONS Engineering Science, INC.

Client Sample ID: SB003-006

HPLC

Lot-Sample #...:	D9D030114-010	Work Order #...:	CT9CW105	Matrix.....:	SO
Date Sampled...:	04/01/99 08:25	Date Received..:	04/03/99		
Prep Date.....:	04/08/99	Analysis Date..:	04/15/99		
Prep Batch #...:	9097380	Analysis Time..:	06:33		
Dilution Factor:	1				
% Moisture.....:	24	Method.....:	SW846 8310		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzo(a)pyrene	ND	26	ug/kg
Naphthalene	**1500**	**260**	**ug/kg**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Terphenyl-d14	64	(22 - 167)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

1C

PARSONS Engineering Science, INC.

Client Sample ID: SB003-006

HPLC

Lot-Sample #...:	D9D030114-010	**Work Order #...:**	CT9CW108	**Matrix.....:**	SO
Date Sampled...:	04/01/99 08:25	**Date Received..:**	04/03/99		
Prep Date.....:	04/08/99	**Analysis Date..:**	04/15/99		
Prep Batch #...:	9097380	**Analysis Time..:**	06:33		
Dilution Factor:	1				
% Moisture.....:	24	**Method.....:**	SW846 8310		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzo(a)pyrene	ND	26	ug/kg
Naphthalene	**1200**	**260**	**ug/kg**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Terphenyl-d14	67	(22 - 167)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

2C

PARSONS Engineering Science, INC.

Client Sample ID: SB001-004

HPLC

Lot-Sample #...: D9D030114-012	Work Order #...: CT9D0105	Matrix.....: SO	
Date Sampled...: 04/01/99 09:15	Date Received..: 04/03/99		
Prep Date.....: 04/08/99	Analysis Date..: 04/15/99		
Prep Batch #...: 9097380	Analysis Time..: 07:03		
Dilution Factor: 1			
% Moisture.....: 20	Method.....: SW846 8310		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Naphthalene	ND	250	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Terphenyl-d14	65	(22 - 167)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

PARSONS Engineering Science, INC.

Client Sample ID: SB001-006

HPLC

Lot-Sample #...:	D9D030114-013	**Work Order #...:**	CT9D3105	**Matrix.....:**	SO
Date Sampled...:	04/01/99 09:25	**Date Received..:**	04/03/99		
Prep Date.....:	04/08/99	**Analysis Date..:**	04/15/99		
Prep Batch #...:	9097380	**Analysis Time..:**	07:33		
Dilution Factor:	1				
% Moisture.....:	28	**Method.....:**	SW846 8310		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Naphthalene	ND	280	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Terphenyl-d14	65	(22 - 167)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

PARSONS Engineering Science, INC.

Client Sample ID: MW001-001

GC Volatiles

Lot-Sample #...:	D9D030114-001	Work Order #...:	CT9A3206	Matrix.....:	WG
Date Sampled...:	04/02/99 10:30	Date Received..:	04/03/99		
Prep Date.....:	04/08/99	Analysis Date..:	04/08/99		
Prep Batch #...:	9099245	Analysis Time..:	15:10		
Dilution Factor:	1				
		Method.....:	RSK SOP-175		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methane	170 B,E	0.50	ug/L

NOTE(S):

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

E Estimated result. Result concentration exceeds the calibration range.

PARSONS Engineering Science, INC.

Client Sample ID: MW001-001

GC Volatiles

Lot-Sample #...:	D9D030114-001	Work Order #...:	CT9A3106	Matrix.....:	WG
Date Sampled...:	04/02/99 10:30	Date Received..:	04/03/99		
Prep Date.....:	04/08/99	Analysis Date..:	04/08/99		
Prep Batch #...:	9099245	Analysis Time..:	16:14		
Dilution Factor:	5				
		Method.....:	RSK SOP-175		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methane	190 B,D	2.5	ug/L

NOTE(S):

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

D Result was obtained from the analysis of a dilution.

PARSONS Engineering Science, INC.

Client Sample ID: MW005-001

GC Volatiles

Lot-Sample #...: D9D030114-002 Work Order #...: CT9C6106 Matrix.....: WG
Date Sampled...: 04/01/99 15:00 Date Received..: 04/03/99
Prep Date.....: 04/08/99 Analysis Date..: 04/08/99
Prep Batch #...: 9099245 Analysis Time..: 15:19
Dilution Factor: 1
Method.....: RSK SOP-175

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methane	200 B,E	0.50	ug/L

NOTE(S):

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

E Estimated result. Result concentration exceeds the calibration range.

PARSONS Engineering Science, INC.

Client Sample ID: MW005-001

GC Volatiles

Lot-Sample #...: D9D030114-002 Work Order #...: CT9C6206 Matrix.....: WG
Date Sampled...: 04/01/99 15:00 Date Received..: 04/03/99
Prep Date.....: 04/08/99 Analysis Date..: 04/08/99
Prep Batch #...: 9099245 Analysis Time..: 16:32
Dilution Factor: 5
Method.....: RSK SOP-175

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methane	170 B,D	2.5	ug/L

NOTE(S):

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

D Result was obtained from the analysis of a dilution.

PARSONS Engineering Science, INC.

Client Sample ID: MW005-101

GC Volatiles

Lot-Sample #...: D9D030114-003 Work Order #...: CT9C7106 Matrix.....: WG
Date Sampled...: 04/01/99 15:40 Date Received..: 04/03/99
Prep Date.....: 04/08/99 Analysis Date..: 04/08/99
Prep Batch #...: 9099245 Analysis Time..: 15:33
Dilution Factor: 1
Method.....: RSK SOP-175

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methane	210 B,E	0.50	ug/L

NOTE(S):

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

E Estimated result. Result concentration exceeds the calibration range.

PARSONS Engineering Science, INC.

Client Sample ID: MW005-101

GC Volatiles

Lot-Sample #...:	D9D030114-003	Work Order #...:	CT9C7206	Matrix.....:	WG
Date Sampled...:	04/01/99 15:40	Date Received..:	04/03/99		
Prep Date.....:	04/08/99	Analysis Date..:	04/08/99		
Prep Batch #...:	9099245	Analysis Time..:	16:41		
Dilution Factor:	5				
		Method.....:	RSK SOP-175		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methane	210 B,D	2.5	ug/L

NOTE(S):

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

D Result was obtained from the analysis of a dilution.

PARSONS Engineering Science, INC.

Client Sample ID: MW010-001

GC Volatiles

Lot-Sample #...: D9D030114-004 Work Order #...: CT9C8106 Matrix.....: WG
Date Sampled...: 04/01/99 16:15 Date Received..: 04/03/99
Prep Date.....: 04/08/99 Analysis Date..: 04/08/99
Prep Batch #...: 9099245 Analysis Time..: 15:39
Dilution Factor: 1
Method.....: RSK SOP-175

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methane	4.7 B	0.50	ug/L

NOTE(S):

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

PARSONS Engineering Science, INC.

Client Sample ID: MW009-001

GC Volatiles

Lot-Sample #...: D9D030114-014 Work Order #...: CT9D7103 Matrix.....: WG
Date Sampled...: 04/01/99 17:20 Date Received..: 04/03/99
Prep Date.....: 04/08/99 Analysis Date..: 04/08/99
Prep Batch #...: 9099245 Analysis Time..: 15:45
Dilution Factor: 1
Method.....: RSK SOP-175

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methane	1.2 B	0.50	ug/L

NOTE(S):

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

PARSONS Engineering Science, INC.

Client Sample ID: MW001-001

General Chemistry

Lot-Sample #...: D9D030114-001 Work Order #...: CT9A3 Matrix.....: WG
Date Sampled...: 04/02/99 10:30 Date Received..: 04/03/99

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Nitrate-Nitrite	0.019 B	0.10	mg/L	MCAWW 353.2	04/05/99	9095380

Dilution Factor: 1 Analysis Time..: 00:00

NOTE(S):

RL Reporting Limit

B Estimated result. Result is less than RL.

PARSONS Engineering Science, INC.

Client Sample ID: MW005-001

General Chemistry

Lot-Sample #...: D9D030114-002 Work Order #...: CT9C6 Matrix.....: WG
Date Sampled...: 04/01/99 15:00 Date Received..: 04/03/99

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Nitrate-Nitrite	0.048 B	0.10	mg/L	MCAWW 353.2	04/05/99	9095380
	Dilution Factor: 1			Analysis Time..: 00:00		

NOTE(S):

RL Reporting Limit

B Estimated result. Result is less than RL.

PARSONS Engineering Science, INC.

Client Sample ID: MW005-101

General Chemistry

Lot-Sample #...: D9D030114-003 Work Order #...: CT9C7 Matrix.....: WG
Date Sampled...: 04/01/99 15:40 Date Received..: 04/03/99

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Nitrate-Nitrite	0.030 B	0.10	mg/L	MCAWW 353.2	04/05/99	9095380

Dilution Factor: 1 Analysis Time..: 00:00

NOTE(S):

RL Reporting Limit

B Estimated result. Result is less than RL.

PARSONS Engineering Science, INC.

Client Sample ID: MW010-001

General Chemistry

Lot-Sample #...: D9D030114-004 Work Order #...: CT9C8 Matrix.....: WG
Date Sampled...: 04/01/99 16:15 Date Received..: 04/03/99

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Nitrate-Nitrite	1.1	0.10	mg/L	MCAWW 353.2	04/05/99	9095380

Dilution Factor: 1 Analysis Time..: 00:00

PARSONS Engineering Science, INC.

Client Sample ID: MW009-004

General Chemistry

Lot-Sample #...: D9D030114-006 Work Order #...: CT9CQ Matrix.....: SO
Date Sampled...: 03/31/99 16:30 Date Received..: 04/03/99
% Moisture.....: 22

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Percent Moisture	22.2	0.10	%	MCAWW 160.3 MOD	04/12-04/13/99	9102368
		Dilution Factor: 1		Analysis Time..: 00:00		
Total Organic Carbon 960 B		2000	mg/kg	SW846 9060	04/07-04/08/99	9098226
		Dilution Factor: 1		Analysis Time..: 10:37		

NOTE(S):

RL Reporting Limit

B Estimated result. Result is less than RL.

PARSONS Engineering Science, INC.

Client Sample ID: MW011-004

General Chemistry

Lot-Sample #...: D9D030114-007 Work Order #...: CT9CR Matrix.....: SO
Date Sampled...: 03/31/99 17:00 Date Received..: 04/03/99
% Moisture.....: 20

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Percent Moisture	19.6	0.10	%	MCAWW 160.3 MOD	04/12-04/13/99	9102368
		Dilution Factor: 1		Analysis Time..: 00:00		
Total Organic Carbon	1760 B	2000	mg/kg	SW846 9060	04/07-04/08/99	9098226
		Dilution Factor: 1		Analysis Time..: 10:00		

NOTE(S):

RL Reporting Limit

B Estimated result. Result is less than RL.

PARSONS Engineering Science, INC.

Client Sample ID: SB003-002

General Chemistry

Lot-Sample #...: D9D030114-008 Work Order #...: CT9CT Matrix.....: SO
Date Sampled...: 04/01/99 08:00 Date Received..: 04/03/99
% Moisture.....: 21

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Percent Moisture	21.3	0.10	%	MCAWW 160.3 MOD	04/12-04/13/99	9102368
		Dilution Factor: 1		Analysis Time..: 00:00		

PARSONS Engineering Science, INC.

Client Sample ID: SB003-004

General Chemistry

Lot-Sample #...: D9D030114-009 Work Order #...: CT9CV Matrix.....: SO
Date Sampled...: 04/01/99 08:15 Date Received..: 04/03/99
% Moisture.....: 22

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Percent Moisture	21.7	0.10	%	MCAWW 160.3 MOD	04/12-04/13/99	9102368

Dilution Factor: 1 Analysis Time..: 00:00

PARSONS Engineering Science, INC.

Client Sample ID: SB003-006

General Chemistry

Lot-Sample #...: D9D030114-010 Work Order #...: CT9CW Matrix.....: SO
Date Sampled...: 04/01/99 08:25 Date Received..: 04/03/99
% Moisture.....: 24

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Percent Moisture	24.0	0.10	%	MCAWW 160.3 MOD	04/12-04/13/99	9102368

Dilution Factor: 1 Analysis Time..: 00:00

PARSONS Engineering Science, INC.

Client Sample ID: SB001-004

General Chemistry

Lot-Sample #...: D9D030114-012 Work Order #...: CT9D0 Matrix.....: SO
Date Sampled...: 04/01/99 09:15 Date Received..: 04/03/99
% Moisture.....: 20

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Percent Moisture	19.6	0.10	%	MCAWW 160.3 MOD	04/12-04/13/99	9102368

Dilution Factor: 1 Analysis Time..: 00:00

PARSONS Engineering Science, INC.

Client Sample ID: SB001-006

General Chemistry

Lot-Sample #...: D9D030114-013 Work Order #...: CT9D3 Matrix.....: SO
Date Sampled...: 04/01/99 09:25 Date Received..: 04/03/99
% Moisture.....: 28

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Percent Moisture	27.7	0.10	%	MCAWW 160.3 MOD	04/12-04/13/99	9102368
		Dilution Factor: 1		Analysis Time..: 00:00		
Total Organic Carbon 1360 B		2000	mg/kg	SW846 9060	04/07-04/08/99	9098226
		Dilution Factor: 1		Analysis Time..: 10:47		

NOTE(S):

RL Reporting Limit

B Estimated result. Result is less than RL.

PARSONS Engineering Science, INC.

Client Sample ID: SB001-002

General Chemistry

Lot-Sample #...: D9D030114-015 Work Order #...: CT9DG Matrix.....: SO
Date Sampled...: 04/01/99 09:05 Date Received..: 04/03/99
% Moisture.....: 16

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Percent Moisture	16.2	0.10	%	MCAWW 160.3 MOD	04/12-04/13/99	9102368
		Dilution Factor: 1		Analysis Time..: 00:00		

[redacted] Chain of Custody Record

DAD030114

Quanterra

QUA-4124

Client: Parsons ES	Project Manager: John Hicks	Date: 4-2-99	Chain Of Custody Number: 49463
Address: 1700 W Broadway	Telephone Number (Area Code)/Fax Number: 303 831 8100 / 8208	Lab Number:	Page 1 of 1
City: Denver / State: CO / Zip Code: 80290	Site Contact: Lee Gorday		
Project Name: Baker Military Gas Station	Carrier/Waybill Number:		
Contract/Purchase Order/Quote No.			

	Sample I.D. No. and Description	Date	Time	Sample Type	Total Volume	Containers Type	Containers No.	Preservative	Condition on Receipt	Analysis: TPH-D	Benzo(a)pyrene	Naphthalene	Nitrate
1	074-MW001-001	4-2-99	1030	Water	4.5L	G1	5	Iu 12504		X	X	X	X
1MS	074-MW001-001-MS	↓	↓	↓	↓	↓	↓	↓		X	X	X	X
1MSD	074-MW001-001-MSD	↓	↓	↓	↓	↓	↓	↓		X	X	X	X

Special Instructions: Temp Blank

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☒ Unknown

Sample Disposal: ☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Turn Around Time Required: ☒ Normal ☐ Rush

QC Level: ☐ I. ☐ II. ☐ III.

Project Specific (Specify):

	Date	Time		Date	Time
1. Relinquished By: Lee L Gorday	4-2-99	1630	1. Received By: To FedEx		
2. Relinquished By:			2. Received By:		
3. Relinquished By:			3. Received By:	040399	0900

Comments:

DISTRIBUTION: WHITE - Stays with Sample; CANARY - Returned to Client with Report; PINK - Field Copy

Chain of Custody Record

D9D030114

Quanterra

OUA-4124

Client: Parsons ES	Project Manager: John Hicks	Date: 4-2-99	Chain Of Custody Number: 49464
Address: 1700 W. Broadway Suite 900	Telephone Number (Area Code)/Fax Number: 303 831 8100 / 8208	Lab Number:	Page 1 of 1
City: Denver / State: CO / Zip Code: 80290	Site Contact: Lee Gordey		
Project Name: Faker Military Gas Station	Carrier/Waybill Number:		
Contract/Purchase Order/Quote No.			

	Sample I.D. No. and Description	Date	Time	Sample Type	Total Volume	Containers Type	Containers No.	Preservative	Condition on Receipt	Analysis: TPH-D	Benzene, Xylenes, MTBE, Naphthalene	Nitrate
2	074-MW005-001	4-1-99	1500	Water	4.5L	G1	5	1 H_2SO_4		X	X	X
3	074-MW005-101	4-1-99	1540	Water	↓	↓	↓	↓		X	X	X
4	074-MW010-100	4-1-99	1645	Water	↓	↓	↓	↓		X	X	X

Special Instructions

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Turn Around Time Required: ☒ Normal ☐ Rush

QC Level: ☐ I. ☐ II. ☐ III.

Project Specific (Specify):

	Relinquished By	Date	Time	Received By	Date	Time
1.	Lee Gordey	4-2-99	1630	To Fedex		
2.						
3.					040399	0900

Comments

DISTRIBUTION: - Stays with Sample; CANARY - Returned to Client with Report; PINK - Field Copy

Chain of Custody Record

D9D030114

Quanterra

QUA 4124

Client: Parsons ES	Project Manager: John Hicks	Date: 4-7-99	Chain Of Custody Number: 49465
Address: 1700 W. Broadway Suite 900	Telephone Number (Area Code)/Fax Number: 303 831 8100 / 8208	Lab Number:	Page 1 of 1
City: Denver / State: CO / Zip Code: 80290	Site Contact: Lee Gorday		
Project Name: Faker Military Gas Station	Carrier/Waybill Number:		
Contract/Purchase Order/Quote No.			

	Sample I.D. No. and Description	Date	Time	Sample Type	Total Volume	Containers Type	Containers No.	Preservative	Condition on Receipt	Analysis: BTEX	MTBE	TPH-G	TPH-D	Naphthalene	Benzo (a) pyrene	TOC	Methane
6	074-MW009-004	3-31-99	1630	Soil	160z	Gl	1	—								X	
7	074-MW011-004	3-31-99	1700	Soil	160z	Glass	1	—								X	
8	074-SB003-002	4-1-99	0800			Sleeve	1				X						
9	074-SB003-004		0815			Sleeve, Gl	3			X	X	X	X	X	X	X	
10	074-SB003-006		0825			"	"			X	X	X	X	X	X	X	
15	074-SB001-002		0905			Sleeve	1				X						
12	074-SB001-004		0915			Sleeve, Gl	3			X	X	X	X	Y		X	
13	074-SB001-006		0925			"	"			X	X	X	X	X		X	
14	074-MW009-001	4-1-99	1720	Water	9X40ml	G-l	9	HCl		X	X	X					X
2	074-MW005-001	"	1500							X	X	X					X
3	074-MW005-101		1540							X	X	X					X
4	074-MW010-001		1615							X	X	X					X
1	074-MW001-001	4-2-99	1030							X	X	X					X
1MS	074-MW001-001-MS									X	X	X					X
1MSD	074-MW001-001-MSD									X	X	X					X
5	TB001	4-1-99			3@40ml		3			X							

Special Instructions: Plus Water Blank

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Turn Around Time Required: ☐ Normal ☐ Rush

QC Level: ☐ I. ☐ II. ☐ III.

Project Specific (Specify):

		Date	Time
1. Relinquished By	Lee Gorday	4-2-99	1630
2. Relinquished By			
3. Relinquished By			

		Date	Time
1. Received By	To Fedex		
2. Received By			
3. Received By		040399	0900

Comments:

DISTRIBUTION: WHITE - Stays with Sample; CANARY - Returned to Client with Report; PINK - Field Copy

Quanterra - Denver
Condition Upon Receipt Anomaly Report (CUR)

Client: D9D030114

Date/Time: 040399 0900

Lot No: Parsons ES

Initiated by: [signature]

Affected Samples

COC# 49464

Client ID	Lab ID	Analyses Requested
074·MW010·001/100	-004	

CONDITION/ANOMALY/VARIANCE (CHECK ALL THAT APPLY):

☐COOLERS
- ☐Not Received, No Chain of Custody (COC)
- ☐Not Received but COC(s) Available
- ☐Leaking
- ☐Other: _____

☐CUSTODY SEALS (COOLER(S)/CONTAINER(S)
- ☐None
- ☐ Not Intact
- ☐Other: _____

☐ TEMPERATURE (greater than 6° C)
- ☐Cooler Temp _____
- ☐Temperature Blank _____

☐CHAIN OF CUSTODY (COCs)
- ☐Not relinquished by Client; No date/time Relinq.
- ☐ Incomplete Information
- ☐Other: _____

☐CONTAINERS
- ☐Leaking
- ☐Broken
- ☐Extra
- ☐Without Labels
- ☐VOA Vials with Headspace _____ mm
- ☐Other: _____

☐ CONTAINER LABELS
- ☐Not the same ID/info as in COC
- ☐ Incomplete

☐ID ☐COLLECTION ☐Time ☐Date ☐PRESERVATIVE
- ☐ Markings/Info smeared or illegible
- ☐Torn
- ☐Other: _____

☐ SAMPLES

☐Samples NOT RECEIVED but listed on COC ----- ☐will be noted on COC Client to send samples with new COC
- ☐Samples received but NOT LISTED on COC
- ☐Logged based on Label Information
- ☐Logged based on info from other samples on COC
- ☐ Logged according to Work Plan
- ☐Logged on HOLD UNTIL FURTHER NOTICE
- ☐ Other: _____

- ☐ Mislabeled as to tests, preservatives, etc.
- ☐Holding time expired
- ☐ Improper container used
- ☐Not preserved / Improper preservative used
- ☐ Improper pH _____ Lab to preserve sample
- ☐ Insufficient quantities for analysis

Comments: on Coc 49464, -004 is incorrectly labelled -100 instead of -001. The times match up so I assumed that it is the same.

Corrective Action:
- ☐ Client Informed: verbally on: _____ By: _____: In writing on: _____ By: _____
- ☐ Sample(s) processed "as is". _____
- ☐ Sample(s) on hold until: _____ If released, notify: _____

Sample Control Supervisor Review: _____ Date: _____

Project Management Review: _____ Date: _____

SIGNED ORIGINAL MUST BE RETAINED IN THE PROJECT FILE

Sample Receiving Checklist

Lot #: D9D03 0114 Date/Time Received: 04/03/99 0900

Company Name & Sampling Site: Parsons ES

*Cooler #(s): 3

Temperatures: 2.7 2.9 2.4

Unpacking & Labeling Check Points:

N/A	Yes	No		Initials
	☑	☐	1. Cooler seals intact.	PK
	☑	☐	2. Chain of custody present.	
	☐	☑	3. Bottles broken and/or are leaking, comment if yes.	
			PHOTOGRAPH BROKEN BOTTLES	
	☑	☐	4. Containers labeled, comment if no.	
	☑	☐	5. pH of all samples checked and meet requirements, note exceptions.	
	☑	☐	6. Chain of custody includes "received by" and "relinquished" by signatures, dates, and times.	
	☑	☐	7. Receipt date(s) > 48 hours past the collection date(s)? If yes, notify PA/PM.	
	☑	☐	8. Chain of custody agrees with bottle count, comment if no.	
	☑	☐	9. Chain of custody agrees with labels, comment if no.	
☐	☑	☐	10. VOA samples filled completely, comment if no.	
☐	☑	☐	11. VOA bottles preserved, check for labels.	
	☐	☑	12. Did samples require preservation with sodium thiosulfate?	
☐	☐	☑	13. If yes to #12, did the samples contain residual chlorine?	
☐	☐	☑	14. Sediment present in "D," dissolved, bottles.	
	☐	☑	15. Are analyses with short holding times requested?	
☐	☐	☑	16. Is extra sample volume provided for MS, MSD or matrix duplicates?	
	☐	☑	17. Multiphase samples present? If yes, comment below.	
	☐	☑	18. Any subsampling for volatiles? If yes, list samples.	
			PHOTOGRAPH MULTIPHASE SAMPLES	
☑	☐	☐	19. Clear picture taken, labeled, and stapled to project folder.	
☑	☐	☐	20. Subcontract COC signed and sent with samples to bottle prep?	
	☐	☑	21. Was sample labeling double checked by a second person?	

Document any problems or discrepancies and the actions taken to resolve them on a Condition Upon Receipt Anomaly Report (CUR)

FAX TRANSMITTAL	# Pages 1 of 1	
To: John Hicks	From: Ellen La Riviere	
Co.: Parsons ES	Quanterra Denver	
Fax #: (303) 831-8208	Phone: (303) 421-6611	Fax: (303) 431-7171

Quanterra
Environmental Services

CONFIRMATION OF COMMUNICATION

Pursuant to our conversation today, the following is Quanterra's understanding of your instructions. We believe this ☐ is ☒ is not a contract change. An estimate of the schedule and cost impact (if any) will follow, so that change order negotiations may begin, if necessary. Meanwhile, Quanterra ☒ will ☐ will not perform according to the revised instructions, unless you instruct otherwise.

Client Name: Parsons Engineering Science	Program Name/LIMS Number: Eaker AFB
Quanterra Project Number: D9D030114	Contact at Laboratory: Ellen La Riviere
Date of Request: April 7, 1999	Contract/Order Number: ST94004-S-056
Date Change Order Submitted to Client: April 7, 1999	Authorized Client Representative: John Hicks

TYPE OF CHANGE:	DESCRIPTION OF MODIFICATION/CHANGE/DISCREPANCY/NOTIFICATION:
☐ Method ☐ Sample Delivery Schedule ☐ SDA Criteria ☐ Matrix ☐ QC Change ☐ Bottles Received ☐ Deliverable ☐ C of C Discrepancies ☐ PROGRAM CHANGE ☒ PROJECT CHANGE ONLY	The client contacted the laboratory on April 7, 1999 to cancel the Total Organic Carbon analyses on samples D9D030114-009 (074-SB003-004), D9D030114-010 (074-SB003-006) and D9D030114-012 (074-SB001-004).

Date change is to be implemented: April 7, 1999

APPROVED BY: CLIENT REP: John R. Hicks 4/9/99

QUANTERRA REP: Ellen LaRiviere

Follow-up required: ☐ N/A

☒ Yes, Describe: Please sign acknowledgment and return to the laboratory.

737786.03220

Post-it™ Fax Note 7671	Date 4/9	# of pages ▶ 1
To Ellen LaRiviere	From John Hicks	
Co./Dept. Quanterra	Co. Parsons ES	
Phone #	Phone # 303-764-1941	
Fax # 303 431 7171	Fax #	

11/95 Rev. 1

Quanterra Incorporated
4955 Yarrow Street
Arvada, Colorado 80002

303 421-6611 Telephone
303 431-7171 Fax

ANALYTICAL REPORT

Eaker AFB
Eaker Military Gas Station

Lot #: D9E070180

John Hicks

Parsons Engineering Services

QUANTERRA INCORPORATED

Ellen La Riviere
Project Manager

May 26, 1999

5/28/99

Manually reviewed:
lab duplicates ✓
surrogates ✓✓✓✓
LCS/LCSD ✓✓✓✓✓✓
MS/MSD ✓✓✓
Method blanks ✓✓✓✓
Field Blanks ✓
Holding Times ✓
Preservation ✓
Field Dups NA

Table Of Contents

Standard Deliverables With Supporting Documentation

Section	Report Contents	Number of Pages
	Standard Deliverables	
A.	Introduction • Table of Contents • Case Narrative • Executive Summary – Detection • Analytical Methods Summary • Method/Analyst Summary • Lot Sample Summary • Analytical Results by Sample • QC Data Association Summary • Chain-of-Custody	53
	Supporting Documentation *[Please Note: A one-page "Description of Supporting Documentation" is provided in the Supporting Documentation section(s).]*	
B.	• Volatile GC/MS	
C.	• Semivolatile GC/MS	
D.	• Volatile GC	
E.	• Semivolatile GC	
F.	• LC/MS or HPLC	
G.	• Metals	
H.	• General Chemistry	
I.	• Subcontracted Data	
	Total # Pages in this Package	

Project Narrative
(D9E070180)

With exceptions noted below and on the data sheets, standard analytical protocols were followed in the analyses of the samples and no problems were encountered or anomalies observed. All laboratory quality control samples analyzed in conjunction with the samples in this project were within acceptable limits.

GC Volatiles

Sample D8E070180-001 was analyzed at a dilution for Methods 8015M – GRO and 8021B – BTEX due to the concentration of target compounds in the sample. The reporting limits have been raised relative to the dilutions required.

Method 8310

Sample D8E070180-001 was analyzed at a dilution for Method 8310 due to the concentration of target compounds in the sample. The reporting limits have been raised accordingly. As a result of the dilution required the surrogate was diluted to less than detectable concentrations in the sample.

Methane

The analysis for methane by RSK-175 was performed by Quanterra's Austin laboratory. The sample was originally analyzed undiluted with the concentration of methane detected above the calibration range of the instrument. The sample was reanalyzed at the appropriate dilution. Both sets of data have been reported.

EXECUTIVE SUMMARY - Detection Highlights

D9E070180

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
MW012-002 05/05/99 12:00 001				
Diesel Range Organics	1.1	1.0	mg/L	SW846 8015 MOD
Methane	460 B,E	0.50	ug/L	RSK SOP-175
Methane	8400 B,D	100	ug/L	RSK SOP-175
Benzene	6300	20	ug/L	SW846 8021B
Benzene	6300	20	ug/L	SW846 8021B
Ethylbenzene	450	100	ug/L	SW846 8021B
Ethylbenzene	450	100	ug/L	SW846 8021B
Methyl tert-butyl ether	650 F	1000	ug/L	SW846 8021B
Methyl tert-butyl ether	650 F	1000	ug/L	SW846 8021B
Toluene	130	20	ug/L	SW846 8021B
Toluene	130	20	ug/L	SW846 8021B
Benzene	6300	20	ug/L	SW846 8021B
Ethylbenzene	440	100	ug/L	SW846 8021B
Methyl tert-butyl ether	760 F	1000	ug/L	SW846 8021B
Toluene	130	20	ug/L	SW846 8021B
Gasoline Range Organics	19 F	20	mg/L	SW846 8015 MOD
Naphthalene	230	5.0	ug/L	SW846 8310
Naphthalene	230	5.0	ug/L	SW846 8310
Naphthalene	190	5.0	ug/L	SW846 8310
Total Alkalinity	449	5.0	mg/L	MCAWW 310.2
Sulfate	2.6 B	5.0	mg/L	SW846 9056
Ammonia as N	0.26	0.10	mg/L	MCAWW 350.1

ANALYTICAL METHODS SUMMARY

D9E070180

PARAMETER	ANALYTICAL METHOD
Alkalinity (Colorimetric, Automated, Methyl Orange	MCAWW 310.2
Dissolved Gases in Water	RSK SOP-175
Extractable Petroleum Hydrocarbons	SW846 8015 MOD
Nitrate-Nitrite	MCAWW 353.2
Nitrogen, Ammonia	MCAWW 350.1
Polynuclear Aromatic Hydrocarbons by HPLC	SW846 8310
Sulfate	SW846 9056
Volatile Petroleum Hydrocarbons	SW846 8015 MOD
Volatiles by GC	SW846 8021B

References:

MCAWW "Methods for Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983 and subsequent revisions.

RSK Sample Prep and Calculations for Dissolved Gas Analysis in Water Samples Using a GC Headspace Equilibration Technique, RSKSOP-175, REV. 0, 8/11/94, USEPA Research Lab

SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

SAMPLE SUMMARY

D9E070180

WO #	SAMPLE#	CLIENT SAMPLE ID	DATE	TIME
CVJ5K	001	MW012-002	05/05/99	12:00
CVJ5R	002	TRIP BLANK	05/05/99	

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

PARSONS Engineering Science, INC.

Client Sample ID: MW012-002

GC Volatiles

Lot-Sample #...: D9E070180-001 Work Order #...: CVJ5K103 Matrix.....: WG
Date Sampled...: 05/05/99 12:00 Date Received..: 05/07/99
Prep Date.....: 05/18/99 Analysis Date..: 05/19/99
Prep Batch #...: 9146259 Analysis Time..: 02:26
Dilution Factor: 200
Method.....: SW846 8021B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	6300	20	ug/L
Ethylbenzene	450	100	ug/L
Methyl tert-butyl ether	650 F	1000	ug/L
Toluene	130	20	ug/L
Xylenes (total)	ND	100	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	97	(82 - 112)
Fluorobenzene	94	(44 - 165)

NOTE(S):

F The analyte was identified but the value was below the RL and above the MDL.

1C

PARSONS Engineering Science, INC.

Client Sample ID: MW012-002

GC Volatiles

Lot-Sample #...: D9E070180-001 Work Order #...: CVJ5K10K Matrix.....: WG
Date Sampled...: 05/05/99 12:00 Date Received..: 05/07/99
Prep Date.....: 05/18/99 Analysis Date..: 05/19/99
Prep Batch #...: 9146259 Analysis Time..: 02:26
Dilution Factor: 200

Method.....: SW846 8021B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	6300	20	ug/L
Ethylbenzene	440	100	ug/L
Methyl tert-butyl ether	760 F	1000	ug/L
Toluene	130	20	ug/L
Xylenes (total)	ND	100	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	97	(82 - 112)
Fluorobenzene	94	(44 - 165)

NOTE(S):

F The analyte was identified but the value was below the RL and above the MDL.

2C

PARSONS Engineering Science, INC.

Client Sample ID: TRIP BLANK

GC Volatiles

Lot-Sample #...: D9E070180-002 Work Order #...: CVJ5R101 Matrix.....: WQ
Date Sampled...: 05/05/99 Date Received..: 05/07/99
Prep Date.....: 05/13/99 Analysis Date..: 05/13/99
Prep Batch #...: 9138251 Analysis Time..: 17:53
Dilution Factor: 1

Method.....: SW846 8021B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	ND	0.10	ug/L
Ethylbenzene	ND	0.50	ug/L
Toluene	ND	0.10	ug/L
Xylenes (total)	ND	0.50	ug/L
Methyl tert-butyl ether	ND	5.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	110	(82 - 112)
Fluorobenzene	106	(44 - 165)

PARSONS Engineering Science, INC.

Client Sample ID: MW012-002

GC Volatiles

Lot-Sample #...: D9E070180-001 Work Order #...: CVJ5K102 Matrix.....: WG
Date Sampled...: 05/05/99 12:00 Date Received..: 05/07/99
Prep Date.....: 05/11/99 Analysis Date..: 05/11/99
Prep Batch #...: 9133180 Analysis Time..: 00:00
Dilution Factor: 200
Method.....: SW846 8015 MOD

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	19 F	20	mg/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	103	(74 - 138)

NOTE(S):

F The analyte was identified but the value was below the RL and above the MDL.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

PARSONS Engineering Science, INC.

Client Sample ID: MW012-002

GC Semivolatiles

Lot-Sample #...: D9E070180-001 Work Order #...: CVJ5K101 Matrix.....: WG
Date Sampled...: 05/05/99 12:00 Date Received..: 05/07/99
Prep Date.....: 05/10/99 Analysis Date..: 05/13/99
Prep Batch #...: 9130152 Analysis Time..: 23:42
Dilution Factor: 1
Method.....: SW846 8015 MOD

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	1.1	1.0	mg/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	60	(57 - 132)
n-Octacosane	49	(26 - 152)

NOTE(S):

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

Sample resembles a hydrocarbon product occurring within the n-alkane range of C10 to C28.

PARSONS Engineering Science, INC.

Client Sample ID: MW012-002

HPLC

Lot-Sample #...: D9E070180-001 Work Order #...: CVJ5K104 Matrix.....: WG
Date Sampled...: 05/05/99 12:00 Date Received..: 05/07/99
Prep Date.....: 05/10/99 Analysis Date..: 05/14/99
Prep Batch #...: 9130147 Analysis Time..: 11:31
Dilution Factor: 5

Method.....: SW846 8310

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzo(a)pyrene	ND U5	0.50	ug/L
Naphthalene	**230 J**	**5.0**	**ug/L**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Terphenyl-d14	0.0 DIL	(25 - 157)

NOTE(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

1C

PARSONS Engineering Science, INC.

Client Sample ID: MW012-002

HPLC

Lot-Sample #...: D9E070180-001 Work Order #...: CVJ5K10J Matrix.....: WG
Date Sampled...: 05/05/99 12:00 Date Received..: 05/07/99
Prep Date.....: 05/10/99 Analysis Date..: 05/14/99
Prep Batch #...: 9130147 Analysis Time..: 11:31
Dilution Factor: 5
Method.....: SW846 8310

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzo(a)pyrene	ND	0.50	ug/L
Naphthalene	190 J	5.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Terphenyl-d14	0.0 DIL	(25 - 157)

NOTE(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

2C

PARSONS Engineering Science, INC.

Client Sample ID: MW012-002

General Chemistry

Lot-Sample #...: D9E070180-001 Work Order #...: CVJ5K Matrix.....: WG
Date Sampled...: 05/05/99 12:00 Date Received..: 05/07/99

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Ammonia as N	0.26	0.10	mg/L	MCAWW 350.1	05/12/99	9132253
		Dilution Factor: 1		Analysis Time..: 11:00		
Nitrate-Nitrite	ND	0.10	mg/L	MCAWW 353.2	05/08/99	9128139
		Dilution Factor: 1		Analysis Time..: 14:00		
Sulfate	2.6 B	5.0	mg/L	SW846 9056	05/14/99	9134321
		Dilution Factor: 1		Analysis Time..: 03:54		
Total Alkalinity	449	5.0	mg/L	MCAWW 310.2	05/13/99	9133229
		Dilution Factor: 1		Analysis Time..: 12:25		

NOTE(S):

RL Reporting Limit

B Estimated result. Result is less than RL.

PARSONS Engineering Science, INC.

Client Sample ID: MW012-002

GC Volatiles

Lot-Sample #...: D9E070180-001 Work Order #...: CVJ5K106 Matrix.....: WG
Date Sampled...: 05/05/99 12:00 Date Received..: 05/07/99
Prep Date.....: 05/12/99 Analysis Date..: 05/12/99
Prep Batch #...: 9134204 Analysis Time..: 17:15
Dilution Factor: 1
Method.....: RSK SOP-175

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methane	460 B,E	0.50	ug/L

NOTE(S):

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

E Estimated result. Result concentration exceeds the calibration range.

PARSONS Engineering Science, INC.

Client Sample ID: MW012-002

GC Volatiles

Lot-Sample #...: D9E070180-001 Work Order #...: CVJ5K206 Matrix.....: WG
Date Sampled...: 05/05/99 12:00 Date Received..: 05/07/99
Prep Date.....: 05/12/99 Analysis Date..: 05/12/99
Prep Batch #...: 9134204 Analysis Time..: 17:33
Dilution Factor: 200
Method.....: RSK SOP-175

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methane	8400 B,D	100	ug/L

NOTE(S):

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

D Result was obtained from the analysis of a dilution.

PHASE III ANALYTICAL RESULTS

Quanterra Incorporated
4955 Yarrow Street
Arvada, Colorado 80002

303 421-6611 Telephone
303 431-7171 Fax

ANALYTICAL REPORT

Eaker AFB
734786.03000

Lot #: D9F170149

John Hicks

Parsons Engineering Services

QUANTERRA INCORPORATED

Dan Moore
Project Manager

June 21, 1999

Project Narrative
(D9F170149)

With exceptions noted below and on the data sheets, standard analytical protocols were followed in the analyses of the samples and no problems were encountered or anomalies observed. All laboratory quality control samples analyzed in conjunction with the samples in this project were within acceptable limits.

GC Volatile - BTEX

Sample D9F170149-001 was diluted 200X and analyzed due to the level of target analytes present in the sample.

The surrogate recovery for sample D9F170149-002 was recovered greater than the upper control. The surrogate recovery is greater than the control limit due to the co-elution of a non-target analyte with the surrogate. The confirmation analysis does not demonstrate the same interference as the primary analysis and therefore, the surrogate recovery is within control limits.

EXECUTIVE SUMMARY - Detection Highlights

D9F170149

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
074-MW013-001 06/15/99 15:45 001				
Benzene	360	20	ug/L	SW846 8021B
Benzene	360	20	ug/L	SW846 8021B
Ethylbenzene	730	100	ug/L	SW846 8021B
Ethylbenzene	730	100	ug/L	SW846 8021B
Xylenes (total)	2600	100	ug/L	SW846 8021B
Xylenes (total)	2600	100	ug/L	SW846 8021B
Benzene	430	20	ug/L	SW846 8021B
Ethylbenzene	800	100	ug/L	SW846 8021B
Toluene	100	20	ug/L	SW846 8021B
Toluene	100	20	ug/L	SW846 8021B
Toluene	110	20	ug/L	SW846 8021B
Xylenes (total)	2700	100	ug/L	SW846 8021B
074-MW014-001 06/15/99 19:00 002				
Toluene	0.30	0.10	ug/L	SW846 8021B
Xylenes (total)	0.70	0.50	ug/L	SW846 8021B
Toluene	0.30	0.10	ug/L	SW846 8021B
Xylenes (total)	0.70	0.50	ug/L	SW846 8021B
Toluene	0.41	0.10		SW846 8021B
Xylenes (total)	0.89	0.50		SW846 8021B

ANALYTICAL METHODS SUMMARY

D9F170149

PARAMETER	ANALYTICAL METHOD
Volatiles by GC	SW846 8021B

References:

SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

SAMPLE SUMMARY

D9F170149

WO #	SAMPLE#	CLIENT SAMPLE ID	DATE	TIME
CX13F	001	074-MW013-001	06/15/99	15:45
CX13G	002	074-MW014-001	06/15/99	19:00

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

PARSONS Engineering Science, INC.

Client Sample ID: 074-MW013-001

GC Volatiles

Lot-Sample #...: D9F170149-001 Work Order #...: CX13F101PR Matrix.....: WG
Date Sampled...: 06/15/99 15:45 Date Received..: 06/17/99
Prep Date.....: 06/17/99 Analysis Date..: 06/17/99
Prep Batch #...: 9169154 Analysis Time..: 17:48
Dilution Factor: 200

Method.....: SW846 8021B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	**360**	**20**	**ug/L**
Ethylbenzene	**730**	**100**	**ug/L**
Xylenes (total)	**2600**	**100**	**ug/L**
Toluene	**100**	**20**	**ug/L**
Methyl tert-butyl ether	ND	1000	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	101	(82 - 112)
Fluorobenzene	99	(44 - 165)

NOTE(S):
1C

PARSONS Engineering Science, INC.

Client Sample ID: 074-MW013-001

GC Volatiles

Lot-Sample #...: D9F170149-001 Work Order #...: CX13F102 Matrix.....: WG
Date Sampled...: 06/15/99 15:45 Date Received..: 06/17/99
Prep Date.....: 06/17/99 Analysis Date..: 06/17/99
Prep Batch #...: 9169154 Analysis Time..: 17:48
Dilution Factor: 200
Method.....: SW846 8021B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	**430**	**20**	**ug/L**
Ethylbenzene	**800**	**100**	**ug/L**
Toluene	**110**	**20**	**ug/L**
Xylenes (total)	**2700**	**100**	**ug/L**
Methyl tert-butyl ether	ND	1000	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	98	(82 - 112)
Fluorobenzene	99	(44 - 165)

NOTE(S):
2C

PARSONS Engineering Science, INC.

Client Sample ID: 074-MW014-001

GC Volatiles

Lot-Sample #...: D9F170149-002 Work Order #...: CX13G101 Matrix.....: WG
Date Sampled...: 06/15/99 19:00 Date Received..: 06/17/99
Prep Date.....: 06/17/99 Analysis Date..: 06/17/99
Prep Batch #...: 9169154 Analysis Time..: 18:24
Dilution Factor: 1

Method.....: SW846 8021B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	ND	0.10	ug/L
Ethylbenzene	ND	0.50	ug/L
Toluene	**0.30**	**0.10**	**ug/L**
Methyl tert-butyl ether	ND	5.0	ug/L
Xylenes (total)	**0.70**	**0.50**	**ug/L**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	0.0 NCS,RA	(82 - 112)
Fluorobenzene	95	(44 - 165)

NOTE(S):

RA Results are from a second analysis of the sample.

1C

PARSONS Engineering Science, INC.

Client Sample ID: 074-MW014-001

GC Volatiles

Lot-Sample #...: D9F170149-002 Work Order #...: CX13G102 Matrix.....: WG
Date Sampled...: 06/15/99 19:00 Date Received..: 06/17/99
Prep Date.....: 06/17/99 Analysis Date..: 06/17/99
Prep Batch #...: 9169154 Analysis Time..: 18:24
Dilution Factor: 1

Method.....: SW846 8021B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	ND	0.10	
Ethylbenzene	ND	0.50	
Toluene	**0.41**	**0.10**	
Xylenes (total)	**0.89**	**0.50**	
Methyl tert-butyl ether	ND	5.0	

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	99	(82 - 112)
Fluorobenzene	95	(44 - 165)

NOTE(S):
2C

AnalyticalTechnologies,Inc.
225 COMMERCE DRIVE
FORT COLLINS, CO
80524
(303) 490-1511
(303) 490-1522 FAX
1 (800) 443-1511

26158

Chain of Custody

DATE 6/15/99 PAGE 1 OF 1

ACCESSION NUMBER: _____

PROJECT MANAGER:	John ~~Ann~~ Hicks
COMPANY:	Parsons Engineering Science
ADDRESS:	1700 Broadway, Suite 900
	Denver, CO. 80290
SAMPLER:	John Tunks
(303) 764-1941 PHONE NUMBER	(303) 831-8208 FAX NUMBER

SAMPLE ID	SAMPLE DATE	SAMPLE TIME	MATRIX	LAB ID
074-MW013-001	6/15/99	1545	GW	
074-MW014-001	6/15/99	1900	GW	

ANALYSIS REQUESTED

	9070/9071 — Oil & Grease	418.1 — TRPH	8015 Mod. — Gasoline	8015 Mod. — Diesel	8015/8020 — Gasoline/BTEX	8020 — BTEX	8240 — GC/MS VOC's	8270 — GC/MS SVOC's	8080 — Pesticides/PCB's	8080 — PCB Only	8310 — PNA's	8150 — Herbicides	8140 — OP Pesticides	TOX — EOX — TX	Total Metals:	TCLP:	Gross Alpha	Gross Beta	Radium 226	Radium 228	Tritium	Strontium	% Moisture	BTEX & MTBE, 8021						Number of Containers
074-MW013-001																								X						3
074-MW014-001																								X						3

PROJECT INFORMATION	SAMPLE RECEIPT	
PROJECT NUMBER: 734786.03000	TOTAL NUMBER OF CONTAINERS	
PROJECT NAME: Eaker	CHAIN OF CUSTODY SEALS Y/N	
PURCHASE ORDER NUMBER:	SEALS INTACT? Y/N/NA	
TAT: ☐ STANDARD ☒ RUSH DUE: 24 hr.	RECEIVED GOOD COND./COLD	

SAMPLE DISPOSAL: ☐ HAZ WASTE $5.00 ☐ RAD CHEM $15.00 ☐ RETURN

Comments:
- Please call John Tunks on cell phone (303)898-0796 with results as soon as they are available
- Please return cooler to John Tunks at hotel in Ark.

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: John Tunks Time: 0700	Signature: Time:	Signature: Time:
Printed Name: John Tunks Date: 5/16/99	Printed Name: Date:	Printed Name: Date:
Company: Parsons ES	Company:	Company:
RECEIVED BY: 1.	**RECEIVED BY: 2.**	**RECEIVED BY: 3.**
Signature: Time: 0830	Signature: Time:	Signature: Time:
Printed Name: N. Sommers Date: 6/17/99	Printed Name: Date:	Printed Name: Date:
Company: Quantera	Company:	Company:

DISTRIBUTION: White, Canary - ANALYTICAL TECHNOLOGIES, INC. • Pink - ORIGINATOR

17

Sample Receiving Checklist

Lot #: D9F170149 Date/Time Received: 0830 6/17/99

Company Name & Sampling Site: Parsons

*Cooler #(s): _____

Temperatures: 1.8

Unpacking & Labeling Check Points:

N/A	Yes	No		Initials
	☑	☐	1. Cooler seals intact.	
	☑	☐	2. Chain of custody present.	
	☐	☑	3. Bottles broken and/or are leaking, comment if yes.	
			PHOTOGRAPH BROKEN BOTTLES	
	☑	☐	4. Containers labeled, comment if no.	
	☐	☑	5. pH of all samples checked and meet requirements, note exceptions.	
	☑	☐	6. Chain of custody includes "received by" and "relinquished" by signatures, dates, and times.	
	☐	☑	7. Receipt date(s) > 48 hours past the collection date(s)? If yes, notify PA/PM.	
	☑	☐	8. Chain of custody agrees with bottle count, comment if no.	
	☑	☐	9. Chain of custody agrees with labels, comment if no.	
☐	☑	☐	10. VOA samples filled completely, comment if no.	
☐	☑	☐	11. VOA bottles preserved, check for labels.	
	☐	☑	12. Did samples require preservation with sodium thiosulfate?	
☐	☐	☑	13. If yes to #12, did the samples contain residual chlorine?	
☐	☐	☑	14. Sediment present in "D," dissolved, bottles.	
	☐	☑	15. Are analyses with short holding times requested?	
☐	☐	☑	16. Is extra sample volume provided for MS, MSD or matrix duplicates?	
	☐	☑	17. Multiphase samples present? If yes, comment below.	
	☐	☑	18. Any subsampling for volatiles? If yes, list samples.	
			PHOTOGRAPH MULTIPHASE SAMPLES	
☑	☐	☐	19. Clear picture taken, labeled, and stapled to project folder.	
☑	☐	☐	20. Subcontract COC signed and sent with samples to bottle prep?	
	☐	☐	21. Was sample labeling double checked by a second person?	

Document any problems or discrepancies and the actions taken to resolve them on a Condition Upon Receipt Anomaly Report (CUR)

Data Receiving 6/24/99
No invoice received

Quanterra

Quanterra Incorporated
4955 Yarrow Street
Arvada, Colorado 80002

303 421-6611 Telephone
303 431-7171 Fax

ANALYTICAL REPORT

Eaker AFB
734786.03000

Lot #: D9F180138

John Hicks

Parsons Engineering Services

QUANTERRA INCORPORATED

Dan Moore
Project Manager

June 23, 1999

Project Narrative

(D9F180138)

With exceptions noted below and on the data sheets, standard analytical protocols were followed in the analyses of the samples and no problems were encountered or anomalies observed. All laboratory quality control samples analyzed in conjunction with the samples in this project were within acceptable limits.

EXECUTIVE SUMMARY - Detection Highlights

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
NO DETECTABLE PARAMETERS				

ANALYTICAL METHODS SUMMARY

D9F180138

PARAMETER	ANALYTICAL METHOD
Volatiles by GC	SW846 8021B

References:

SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

SAMPLE SUMMARY

D9F180138

WO #	SAMPLE#	CLIENT SAMPLE ID	DATE	TIME
CX302	001	074-SB009-001	06/16/99	14:40
CX305	002	074-TW010-001	06/17/99	21:30
CX307	003	074-TW011-001	06/17/99	14:00
CX309	004	074-TW011-101	06/17/99	14:05

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
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PARSONS Engineering Science, INC.

Client Sample ID: 074-SB009-001

GC Volatiles

Lot-Sample #...: D9F180138-001 **Work Order #...:** CX302101 **Matrix.....:** WATER
Date Sampled...: 06/16/99 14:40 **Date Received..:** 06/18/99
Prep Date.....: 06/21/99 **Analysis Date..:** 06/21/99
Prep Batch #...: 9173174 **Analysis Time..:** 15:45
Dilution Factor: 1

Method.....: SW846 8021B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	ND	0.10	ug/L
Ethylbenzene	ND	0.50	ug/L
Toluene	ND	0.10	ug/L
Xylenes (total)	ND	0.50	ug/L
Methyl tert-butyl ether	ND	5.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	96	(82 - 112)
Fluorobenzene	97	(44 - 165)

PARSONS Engineering Science, INC.

Client Sample ID: 074-TW010-001

GC Volatiles

Lot-Sample #...: D9F180138-002 Work Order #...: CX305101 Matrix.....: WATER
Date Sampled...: 06/17/99 21:30 Date Received..: 06/18/99
Prep Date.....: 06/21/99 Analysis Date..: 06/21/99
Prep Batch #...: 9173174 Analysis Time..: 16:20
Dilution Factor: 1

Method.....: SW846 8021B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	ND	0.10	ug/L
Ethylbenzene	ND	0.50	ug/L
Toluene	ND	0.10	ug/L
Xylenes (total)	ND	0.50	ug/L
Methyl tert-butyl ether	ND	5.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	93	(82 - 112)
Fluorobenzene	94	(44 - 165)

PARSONS Engineering Science, INC.

Client Sample ID: 074-TW011-001

GC Volatiles

Lot-Sample #...: D9F180138-003 Work Order #...: CX307101 Matrix.....: WATER
Date Sampled...: 06/17/99 14:00 Date Received..: 06/18/99
Prep Date.....: 06/21/99 Analysis Date..: 06/21/99
Prep Batch #...: 9173174 Analysis Time..: 16:56
Dilution Factor: 1
Method.....: SW846 8021B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	ND	0.10	ug/L
Ethylbenzene	ND	0.50	ug/L
Toluene	ND	0.10	ug/L
Xylenes (total)	ND	0.50	ug/L
Methyl tert-butyl ether	ND	5.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	109	(82 - 112)
Fluorobenzene	96	(44 - 165)

PARSONS Engineering Science, INC.

Client Sample ID: 074-TW011-101

GC Volatiles

Lot-Sample #...: D9F180138-004 Work Order #...: CX309101 Matrix.....: WATER
Date Sampled...: 06/17/99 14:05 Date Received..: 06/18/99
Prep Date.....: 06/21/99 Analysis Date..: 06/21/99
Prep Batch #...: 9173174 Analysis Time..: 17:31
Dilution Factor: 1

Method.....: SW846 8021B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	ND	0.10	ug/L
Ethylbenzene	ND	0.50	ug/L
Toluene	ND	0.10	ug/L
Xylenes (total)	ND	0.50	ug/L
Methyl tert-butyl ether	ND	5.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	108	(82 - 112)
Fluorobenzene	96	(44 - 165)

Chain of Custody Record

9F180138 26758 4.9

Quanterra

QUA-4124 0797

Client	Project Manager	Date	Chain of Custody Number
Parsons ES	John Hicks	6/17/99	23377
Address	**Telephone Number (Area Code)/Fax Number**	**Lab Number**	**Page 1 of 1**
1700 Broadway Suite 900	(303) 831-8100		
City / State / Zip Code	**Site Contact**	**Lab Contact**	
Denver / CO / ~~800~~ 80290	John Tunks		
Project Name	**Carrier/Waybill Number**		
Eaker			
Contract/Purchase Order/Quote No.			
734786.03000			

	Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H_2SO_4	HNOS	HCl	NaOH	ZnAc/NaOH	Analysis: BTEX/MTBE 8021	Special Instructions/ Conditions of Receipt
1	074-~~FW~~SB009-001	6/16/99	1440	X						X			X	X
2	074-TW010-001	6/17/99	0930	X						X			X	
3	074-TW011-001	6/17/99	1400	X						X			X	
4	074-TW011-101	6/17/99	1405	X						X			X	

J.T.

J.T.

Possible Hazard Identification

☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal

☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months (A fee may be assessed if samples are retained longer than 3 months)

~~Turn Around~~ Time Required

☒ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☐ Other_____

QC Requirements (Specify)

	Date	Time		Date	Time
1. ~~Relinquished~~ By John Tunks			1. Received By		
2. Relinquished By			2. Received By		
3. Relinquished By			3. Received By		

Comments

DISTRIB[illegible] WHITE - Stays with the Sample; CANARY - Returned to Client with Report; PINK - Field Co[illegible]

Sample Receiving Checklist

Lot #: D9F180138 Date/Time Received: 0830 6/18/99

Company Name & Sampling Site: Parsons

*Cooler #(s):

Temperatures: 4.9

Unpacking & Labeling Check Points:

N/A	Yes	No		Initials
	☑	☐	1. Cooler seals intact.	KD
	☑	☐	2. Chain of custody present.	
	☐	☑	3. Bottles broken and/or are leaking, comment if yes.	
			PHOTOGRAPH BROKEN BOTTLES	
	☑	☐	4. Containers labeled, comment if no.	
	☐	☑	5. pH of all samples checked and meet requirements, note exceptions.	
	☑	☐	6. Chain of custody includes "received by" and "relinquished" by signatures, dates, and times.	
	☐	☑	7. Receipt date(s) > 48 hours past the collection date(s)? If yes, notify PA/PM.	
	☑	☐	8. Chain of custody agrees with bottle count, comment if no.	
	☑	☐	9. Chain of custody agrees with labels, comment if no.	
☐	☑	☐	10. VOA samples filled completely, comment if no.	
☐	☑	☐	11. VOA bottles preserved, check for labels.	
	☐	☑	12. Did samples require preservation with sodium thiosulfate?	
☐	☐	☑	13. If yes to #12, did the samples contain residual chlorine?	
☐	☐	☑	14. Sediment present in "D," dissolved, bottles.	
	☐	☑	15. Are analyses with short holding times requested?	
☐	☐	☑	16. Is extra sample volume provided for MS, MSD or matrix duplicates?	
	☐	☑	17. Multiphase samples present? If yes, comment below.	
	☐	☑	18. Any subsampling for volatiles? If yes, list samples.	
			PHOTOGRAPH MULTIPHASE SAMPLES	
☑	☐	☐	19. Clear picture taken, labeled, and stapled to project folder.	
☑	☐	☐	20. Subcontract COC signed and sent with samples to bottle prep?	
	☐	☐	21. Was sample labeling double checked by a second person?	

Document any problems or discrepancies and the actions taken to resolve them on a Condition Upon Receipt Anomaly Report (CUR)

Rec'd 7/9/99

Quanterra

Quanterra Incorporated
4955 Yarrow Street
Arvada, Colorado 80002

303 421-6611 Telephone
303 431-7171 Fax

ANALYTICAL REPORT

Eaker AFB
734786.03000

Lot #: D9F230176

John Hicks

Parsons Engineering Services

QUANTERRA INCORPORATED

Dan Moore
Project Manager

July 8, 1999

Project Narrative

(D9F230176)

With exceptions noted below and on the data sheets, standard analytical protocols were followed in the analyses of the samples and no problems were encountered or anomalies observed. All laboratory quality control samples analyzed in conjunction with the samples in this project were within acceptable limits.

ANALYTICAL METHODS SUMMARY

D9F230176

PARAMETER	ANALYTICAL METHOD
Volatile Organics by GC/MS	SW846 8260B

References:

SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

SAMPLE SUMMARY

D9F230176

WO #	SAMPLE#	CLIENT SAMPLE ID	DATE	TIME
CX8DV	001	074-TW012-001 SP 40-44'	06/18/99	10:30
CX8DX	002	074-TW013-001 SP 29-33'	06/18/99	16:10
CX8E0	003	074-TW017I-001	06/21/99	18:20
CX8E1	004	074-TW016I-001	06/21/99	11:00
CX8E2	005	074-TW018I-001	06/22/99	10:45
CX8E3	006	074-TW016D-001	06/21/99	15:40
CX8E4	007	074-TW012-001 SP 56-60'	06/18/99	18:30
CX8E5	008	074-TW014-001 SP 29-33'	06/19/99	11:10
CX8E6	009	TRIP BLANK	06/22/99	12:50

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

PARSONS Engineering Science, INC.

Client Sample ID: 074-TW012-001 SP 40-44'

GC/MS Volatiles

Lot-Sample #...: D9F230176-001 Work Order #...: CX8DV102 Matrix.....: WG
Date Sampled...: 06/18/99 10:30 Date Received..: 06/23/99
Prep Date.....: 06/28/99 Analysis Date..: 06/28/99
Prep Batch #...: 9182317 Analysis Time..: 16:13
Dilution Factor: 125

Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	2500	62	ug/L
Ethylbenzene	16 F	75	ug/L
Naphthalene	82 F	120	ug/L
Toluene	35 F	140	ug/L
o-Xylene	13 F	140	ug/L
Methyl tert-butyl ether	280 F	620	ug/L
m-Xylene & p-Xylene	89 F	120	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	106	(75 - 125)
Toluene-d8	102	(75 - 125)
4-Bromofluorobenzene	101	(75 - 125)
1,2-Dichloroethane-d4	99	(62 - 139)

NOTE(S):

F The analyte was identified but the value was below the RL and above the MDL.

PARSONS Engineering Science, INC.

Client Sample ID: 074-TW013-001 SP 29-33'

GC/MS Volatiles

Lot-Sample #...: D9F230176-002 **Work Order #...:** CX8DX102 **Matrix.....:** WG
Date Sampled...: 06/18/99 16:10 **Date Received..:** 06/23/99
Prep Date.....: 06/28/99 **Analysis Date..:** 06/28/99
Prep Batch #...: 9182317 **Analysis Time..:** 18:05
Dilution Factor: 1

Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	ND	0.50	ug/L
Ethylbenzene	ND	0.60	ug/L
Naphthalene	ND	1.0	ug/L
Toluene	ND	1.1	ug/L
o-Xylene	ND	1.1	ug/L
Methyl tert-butyl ether	**0.82 F**	**5.0**	**ug/L**
m-Xylene & p-Xylene	ND	1.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	107	(75 - 125)
Toluene-d8	101	(75 - 125)
4-Bromofluorobenzene	103	(75 - 125)
1,2-Dichloroethane-d4	99	(62 - 139)

NOTE(S):

F The analyte was identified but the value was below the RL and above the MDL.

PARSONS Engineering Science, INC.

Client Sample ID: 074-TW017I-001

GC/MS Volatiles

Lot-Sample #...: D9F230176-003 Work Order #...: CX8E0102 Matrix.....: WG
Date Sampled...: 06/21/99 18:20 Date Received..: 06/23/99
Prep Date.....: 06/28/99 Analysis Date..: 06/28/99
Prep Batch #...: 9182317 Analysis Time..: 18:28
Dilution Factor: 1

Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	ND	0.50	ug/L
Ethylbenzene	ND	0.60	ug/L
Naphthalene	ND	1.0	ug/L
Toluene	ND	1.1	ug/L
o-Xylene	ND	1.1	ug/L
Methyl tert-butyl ether	ND	5.0	ug/L
m-Xylene & p-Xylene	ND	1.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	104	(75 - 125)
Toluene-d8	100	(75 - 125)
4-Bromofluorobenzene	106	(75 - 125)
1,2-Dichloroethane-d4	95	(62 - 139)

PARSONS Engineering Science, INC.

Client Sample ID: 074-TW016I-001

GC/MS Volatiles

Lot-Sample #...: D9F230176-004	**Work Order #...:** CX8E1102	**Matrix.....:** WG	
Date Sampled...: 06/21/99 11:00	**Date Received..:** 06/23/99		
Prep Date.....: 06/28/99	**Analysis Date..:** 06/28/99		
Prep Batch #...: 9182317	**Analysis Time..:** 18:50		
Dilution Factor: 1			
	Method.....: SW846 8260B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	**0.11 F**	**0.50**	**ug/L**
Ethylbenzene	ND	0.60	ug/L
Naphthalene	ND	1.0	ug/L
Toluene	ND	1.1	ug/L
o-Xylene	ND	1.1	ug/L
Methyl tert-butyl ether	ND	5.0	ug/L
m-Xylene & p-Xylene	ND	1.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	105	(75 - 125)
Toluene-d8	100	(75 - 125)
4-Bromofluorobenzene	104	(75 - 125)
1,2-Dichloroethane-d4	95	(62 - 139)

NOTE(S):

F The analyte was identified but the value was below the RL and above the MDL.

PARSONS Engineering Science, INC.

Client Sample ID: 074-TW018I-001

GC/MS Volatiles

Lot-Sample #...: D9F230176-005 **Work Order #...:** CX8E2102 **Matrix.....:** WG
Date Sampled...: 06/22/99 10:45 **Date Received..:** 06/23/99
Prep Date.....: 06/28/99 **Analysis Date..:** 06/28/99
Prep Batch #...: 9182317 **Analysis Time..:** 19:13
Dilution Factor: 1

Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	ND	0.50	ug/L
Ethylbenzene	ND	0.60	ug/L
Naphthalene	ND	1.0	ug/L
Toluene	ND	1.1	ug/L
o-Xylene	ND	1.1	ug/L
Methyl tert-butyl ether	ND	5.0	ug/L
m-Xylene & p-Xylene	ND	1.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	105	(75 - 125)
Toluene-d8	100	(75 - 125)
4-Bromofluorobenzene	105	(75 - 125)
1,2-Dichloroethane-d4	96	(62 - 139)

PARSONS Engineering Science, INC.

Client Sample ID: 074-TW016D-001

GC/MS Volatiles

Lot-Sample #...: D9F230176-006	**Work Order #...:** CX8E3102	**Matrix.....:** WG	
Date Sampled...: 06/21/99 15:40	**Date Received..:** 06/23/99		
Prep Date.....: 06/28/99	**Analysis Date..:** 06/28/99		
Prep Batch #...: 9182317	**Analysis Time..:** 19:35		
Dilution Factor: 6.25			
	Method.....: SW846 8260B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	**2.6 F**	**3.1**	**ug/L**
Ethylbenzene	ND	3.8	ug/L
Naphthalene	ND	6.2	ug/L
Toluene	ND	6.9	ug/L
o-Xylene	ND	6.9	ug/L
Methyl tert-butyl ether	**230**	**31**	**ug/L**
m-Xylene & p-Xylene	ND	6.2	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	110	(75 - 125)
Toluene-d8	101	(75 - 125)
4-Bromofluorobenzene	105	(75 - 125)
1,2-Dichloroethane-d4	103	(62 - 139)

NOTE(S):

F The analyte was identified but the value was below the RL and above the MDL.

PARSONS Engineering Science, INC.

Client Sample ID: 074-TW012-001 SP 56-60'

GC/MS Volatiles

Lot-Sample #...: D9F230176-007 Work Order #...: CX8E4102 Matrix.....: WG
Date Sampled...: 06/18/99 18:30 Date Received..: 06/23/99
Prep Date.....: 06/28/99 Analysis Date..: 06/28/99
Prep Batch #...: 9182317 Analysis Time..: 19:58
Dilution Factor: 2
Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	4.3	1.0	ug/L
Ethylbenzene	2.2	1.2	ug/L
Naphthalene	ND	2.0	ug/L
Toluene	0.33 F	2.2	ug/L
o-Xylene	1.8 F	2.2	ug/L
Methyl tert-butyl ether	0.71 F	10	ug/L
m-Xylene & p-Xylene	5.8	2.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	108	(75 - 125)
Toluene-d8	100	(75 - 125)
4-Bromofluorobenzene	103	(75 - 125)
1,2-Dichloroethane-d4	99	(62 - 139)

NOTE(S):

F The analyte was identified but the value was below the RL and above the MDL.

PARSONS Engineering Science, INC.

Client Sample ID: 074-TW014-001 SP 29-33'

GC/MS Volatiles

Lot-Sample #...: D9F230176-008	**Work Order #...:** CX8E5102	**Matrix.....:** WG	
Date Sampled...: 06/19/99 11:10	**Date Received..:** 06/23/99		
Prep Date.....: 06/28/99	**Analysis Date..:** 06/28/99		
Prep Batch #...: 9182317	**Analysis Time..:** 20:20		
Dilution Factor: 1			
	Method.....: SW846 8260B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	**1.4**	**0.50**	**ug/L**
Ethylbenzene	**0.10 F**	**0.60**	**ug/L**
Naphthalene	ND	1.0	ug/L
Toluene	ND	1.1	ug/L
o-Xylene	ND	1.1	ug/L
Methyl tert-butyl ether	ND	5.0	ug/L
m-Xylene & p-Xylene	ND	1.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	109	(75 - 125)
Toluene-d8	101	(75 - 125)
4-Bromofluorobenzene	104	(75 - 125)
1,2-Dichloroethane-d4	101	(62 - 139)

NOTE(S):

F The analyte was identified but the value was below the RL and above the MDL.

PARSONS Engineering Science, INC.

Client Sample ID: TRIP BLANK

GC/MS Volatiles

Lot-Sample #...: D9F230176-009 Work Order #...: CX8E6102 Matrix.....: WG
Date Sampled...: 06/22/99 12:50 Date Received..: 06/23/99
Prep Date.....: 06/28/99 Analysis Date..: 06/28/99
Prep Batch #...: 9182317 Analysis Time..: 20:42
Dilution Factor: 1
Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	ND	0.50	ug/L
Ethylbenzene	ND	0.60	ug/L
Naphthalene	ND	1.0	ug/L
Toluene	ND	1.1	ug/L
o-Xylene	ND	1.1	ug/L
Methyl tert-butyl ether	ND	5.0	ug/L
m-Xylene & p-Xylene	ND	1.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	104	(75 - 125)
Toluene-d8	100	(75 - 125)
4-Bromofluorobenzene	104	(75 - 125)
1,2-Dichloroethane-d4	95	(62 - 139)

Chain of Custody Record

26758 0.0

Quanterra

QUA-4124 0797

Client	Project Manager	Date	Chain of Custody Number
Eaker ~~AFB~~ Parsons ES	John Hicks	6/22/99	23378

Address	Telephone Number (Area Code)/Fax Number	Lab Number
1700 Broadway, Suite 900	(303) 831-8100 / 303-831-8208	Page ____ of ____

City	State	Zip Code	Site Contact	Lab Contact
Denver	CO	80290	John Tunks	Dan Moore

Project Name	Carrier/Waybill Number
Eaker AFB	Fed Ex / 808723113407

Contract/Purchase Order/Quote No.: 734786.03000

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Analysis: 8260 BTEX/8150	Special Instructions/ Conditions of Receipt
1 074-TW012-001 SP 40-44'	6/18/99	1030	X						X			X	
2 074-TW013-001 SP 29-33'	6/18/99	1610	X						X			X	
3 074-TW017I-001	6/21/99	1820	X						X			X	
4 074-TW016I-001	6/21/99	1100	X						X			X	
5 074-TW018I-001	6/22/99	1045	X						X			X	
6 074-TW016D-001	6/21/99	1540	X						X			X	
7 074-TW012-001 SP 56-60'	6/18/99	1830	X						X			X	
8 074-TW014-001 SP 29-33'	6/19/99	1110	X						X			X	
9 Trip Blank	6/22/99	1250	X						X			X	

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return To Client ☑ Disposal By Lab ☐ Archive For ____ Months (A fee may be assessed if samples are retained longer than 3 months)

Turn Around Time Required: ☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☑ Other as per contract

QC Requirements (Specify)

1. Relinquished By	Date	Time	1. Received By	Date	Time
John Tunks	6/22/99	1250		6/23/99	0900
2. Relinquished By	Date	Time	2. Received By	Date	Time
3. Relinquished By	Date	Time	3. Received By	Date	Time

Comments

DISTR WHITE - Stays with the Sample; CANARY - Returned to Client with Report; PINK - Field C

23

Sample Receiving Checklist

Lot #: D9F230176 Date/Time Received: 0900 6/23/99

Company Name & Sampling Site: Parsons

*Cooler #(s): _____ _____ _____ _____ _____ _____ _____ _____

Temperatures: 18 _____ _____ _____ _____ _____ _____ _____

Unpacking & Labeling Check Points:

N/A	Yes	No		Initials
	☑	☐	1. Cooler seals intact.	✓
	☑	☐	2. Chain of custody present.	
	☐	☑	3. Bottles broken and/or are leaking, comment if yes.	
			PHOTOGRAPH BROKEN BOTTLES	
	☑	☐	4. Containers labeled, comment if no.	
	☐	☑	5. pH of all samples checked and meet requirements, note exceptions.	
	☑	☐	6. Chain of custody includes "received by" and "relinquished" by signatures, dates, and times.	
	☑	☐	7. Receipt date(s) > 48 hours past the collection date(s)? If yes, notify PA/PM.	
	☑	☐	8. Chain of custody agrees with bottle count, comment if no.	
	☑	☐	9. Chain of custody agrees with labels, comment if no.	
☐	☑	☐	10. VOA samples filled completely, comment if no.	
☐	☑	☐	11. VOA bottles preserved, check for labels.	
	☐	☑	12. Did samples require preservation with sodium thiosulfate?	
☐	☐	☑	13. If yes to #12, did the samples contain residual chlorine?	
☐	☐	☑	14. Sediment present in "D," dissolved, bottles.	
	☐	☑	15. Are analyses with short holding times requested?	
☐	☐	☑	16. Is extra sample volume provided for MS, MSD or matrix duplicates?	
	☐	☑	17. Multiphase samples present? If yes, comment below.	
	☐	☑	18. Any subsampling for volatiles? If yes, list samples.	
			PHOTOGRAPH MULTIPHASE SAMPLES	
☑	☐	☐	19. Clear picture taken, labeled, and stapled to project folder.	✓
☑	☐	☐	20. Subcontract COC signed and sent with samples to bottle prep?	
	☐	☐	21. Was sample labeling double checked by a second person?	

Document any problems or discrepancies and the actions taken to resolve them on a Condition Upon Receipt Anomaly Report (CUR)

Quanterra Incorporated
4955 Yarrow Street
Arvada, Colorado 80002

303 421-6611 Telephone
303 431-7171 Fax

ANALYTICAL REPORT

Eaker AFB
734786.03000

Lot #: D9F260122

John Hicks

Parsons Engineering Services

QUANTERRA INCORPORATED

Dan Moore
Project Manager

July 15, 1999

Project Narrative
(D9F260122)

With exceptions noted below and on the data sheets, standard analytical protocols were followed in the analyses of the samples and no problems were encountered or anomalies observed. All laboratory quality control samples analyzed in conjunction with the samples in this project were within acceptable limits.

GC/MS Volatiles

Sample D9F260122-006 was analyzed diluted due to the presence of target analytes.

GC Volatiles – GRO

Sample D9F260122-006 was analyzed diluted due to the presence of target analytes.

EXECUTIVE SUMMARY - Detection Highlights

D9F260122

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
074-SB010-015 06/23/99 13:00 002				
Total Organic Carbon	1370 B	2000	mg/kg	SW846 9060
Percent Moisture	14.5	0.10	%	ASTM D 2216-90
074-SB017-024 06/23/99 18:20 003				
Total Organic Carbon	3820	2000	mg/kg	SW846 9060
Percent Moisture	9.1	0.10	%	ASTM D 2216-90
074-SB017-021 06/23/99 17:20 004				
Total Organic Carbon	1630 B	2000	mg/kg	SW846 9060
Percent Moisture	15.6	0.10	%	ASTM D 2216-90
074-MW-15D-001 06/24/99 17:15 005				
Methane	4.9 B	0.50	ug/L	RSK SOP-175
Gasoline Range Organics	0.021 F	0.10	mg/L	SW846 8015 MOD
Benzene	0.16 F	0.50	ug/L	SW846 8260B
Methyl tert-butyl ether	2.0 F	5.0	ug/L	SW846 8260B
074-MW-15I-001 06/24/99 14:35 006				
Diesel Range Organics	0.36 F	1.0	mg/L	SW846 8015 MOD
Methane	450 B,E	0.50	ug/L	RSK SOP-175
Methane	3600 B,D	50	ug/L	RSK SOP-175
Gasoline Range Organics	2.6	1.0	mg/L	SW846 8015 MOD
Benzene	660	12	ug/L	SW846 8260B
Toluene	8.1 F	28	ug/L	SW846 8260B
o-Xylene	3.4 F	28	ug/L	SW846 8260B
Methyl tert-butyl ether	82 F	120	ug/L	SW846 8260B
m-Xylene & p-Xylene	14 F	25	ug/L	SW846 8260B
Nitrate-Nitrite	0.015 B	0.10	mg/L	MCAWW 353.2

ANALYTICAL METHODS SUMMARY

D9F260122

PARAMETER	ANALYTICAL METHOD
Dissolved Gases in Water	RSK SOP-175
Extractable Petroleum Hydrocarbons	SW846 8015 MOD
Method for Determination of Water Content of Soil	ASTM D 2216-90
Nitrate-Nitrite	MCAWW 353.2
Total Organic Carbon	SW846 9060
Volatile Organics by GC/MS	SW846 8260B
Volatile Petroleum Hydrocarbons	SW846 8015 MOD

References:

ASTM Annual Book Of ASTM Standards.

MCAWW "Methods for Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983 and subsequent revisions.

RSK Sample Prep and Calculations for Dissolved Gas Analysis in Water Samples Using a GC Headspace Equilibration Technique, RSKSOP-175, REV. 0, 8/11/94, USEPA Research Lab

SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

SAMPLE SUMMARY

D9F260122

WO #	SAMPLE#	CLIENT SAMPLE ID	DATE	TIME
CXE23	001	074-TW019I-001	06/22/99	15:55
CXE24	002	074-SB010-015	06/23/99	13:00
CXE26	003	074-SB017-024	06/23/99	18:20
CXE27	004	074-SB017-021	06/23/99	17:20
CXE28	005	074-MW-15D-001	06/24/99	17:15
CXE2C	006	074-MW-15I-001	06/24/99	14:35
CXE2E	007	TRIP BLANK	06/24/99	

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

PARSONS Engineering Science, INC.

Client Sample ID: 074-TW019I-001

GC/MS Volatiles

Lot-Sample #...: D9F260122-001 Work Order #...: CXE23101 Matrix.....: WATER
Date Sampled...: 06/22/99 15:55 Date Received..: 06/26/99
Prep Date.....: 06/28/99 Analysis Date..: 06/28/99
Prep Batch #...: 9182317 Analysis Time..: 21:27
Dilution Factor: 1

Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	ND	0.50	ug/L
Ethylbenzene	ND	0.60	ug/L
Naphthalene	ND	1.0	ug/L
Toluene	ND	1.1	ug/L
o-Xylene	ND	1.1	ug/L
Methyl tert-butyl ether	ND	5.0	ug/L
m-Xylene & p-Xylene	ND	1.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	107	(75 - 125)
Toluene-d8	100	(75 - 125)
4-Bromofluorobenzene	104	(75 - 125)
1,2-Dichloroethane-d4	95	(62 - 139)

PARSONS Engineering Science, INC.

Client Sample ID: 074-MW-15D-001

GC/MS Volatiles

Lot-Sample #...: D9F260122-005 Work Order #...: CXE28101 Matrix.....: WATER
Date Sampled...: 06/24/99 17:15 Date Received..: 06/26/99
Prep Date.....: 06/28/99 Analysis Date..: 06/28/99
Prep Batch #...: 9182317 Analysis Time..: 21:49
Dilution Factor: 1

Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	**0.16 F**	**0.50**	**ug/L**
Ethylbenzene	ND	0.60	ug/L
Naphthalene	ND	1.0	ug/L
Toluene	ND	1.1	ug/L
o-Xylene	ND	1.1	ug/L
Methyl tert-butyl ether	**2.0 F**	**5.0**	**ug/L**
m-Xylene & p-Xylene	ND	1.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	106	(75 - 125)
Toluene-d8	100	(75 - 125)
4-Bromofluorobenzene	104	(75 - 125)
1,2-Dichloroethane-d4	98	(62 - 139)

NOTE(S):

F The analyte was identified but the value was below the RL and above the MDL.

PARSONS Engineering Science, INC.

Client Sample ID: 074-MW-15I-001

GC/MS Volatiles

Lot-Sample #...: D9F260122-006 Work Order #...: CXE2C106 Matrix.....: WATER
Date Sampled...: 06/24/99 14:35 Date Received..: 06/26/99
Prep Date.....: 06/28/99 Analysis Date..: 06/28/99
Prep Batch #...: 9182317 Analysis Time..: 22:11
Dilution Factor: 25

Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	**660**	**12**	**ug/L**
Ethylbenzene	ND	15	ug/L
Naphthalene	ND	25	ug/L
Toluene	**8.1 F**	**28**	**ug/L**
o-Xylene	**3.4 F**	**28**	**ug/L**
Methyl tert-butyl ether	**82 F**	**120**	**ug/L**
m-Xylene & p-Xylene	**14 F**	**25**	**ug/L**
1,2,4-Trimethylbenzene	ND	32	ug/L
1,3,5-Trimethylbenzene	ND	12	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	106	(75 - 125)
Toluene-d8	100	(75 - 125)
4-Bromofluorobenzene	104	(75 - 125)
1,2-Dichloroethane-d4	99	(62 - 139)

NOTE(S):

F The analyte was identified but the value was below the RL and above the MDL.

PARSONS Engineering Science, INC.

Client Sample ID: TRIP BLANK

GC/MS Volatiles

Lot-Sample #...: D9F260122-007 Work Order #...: CXE2E101 Matrix.....: WATER
Date Sampled...: 06/24/99 Date Received..: 06/26/99
Prep Date.....: 06/28/99 Analysis Date..: 06/28/99
Prep Batch #...: 9182317 Analysis Time..: 22:33
Dilution Factor: 1

Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	ND	0.50	ug/L
Ethylbenzene	ND	0.60	ug/L
Naphthalene	ND	1.0	ug/L
Toluene	ND	1.1	ug/L
o-Xylene	ND	1.1	ug/L
Methyl tert-butyl ether	ND	5.0	ug/L
m-Xylene & p-Xylene	ND	1.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	105	(75 - 125)
Toluene-d8	99	(75 - 125)
4-Bromofluorobenzene	106	(75 - 125)
1,2-Dichloroethane-d4	96	(62 - 139)

PARSONS Engineering Science, INC.

Client Sample ID: 074-MW-15D-001

GC Volatiles

Lot-Sample #...: D9F260122-005	Work Order #...: CXE28103	Matrix.....: WATER	
Date Sampled...: 06/24/99 17:15	Date Received..: 06/26/99		
Prep Date.....: 07/01/99	Analysis Date..: 07/01/99		
Prep Batch #...: 9183210	Analysis Time..: 14:45		
Dilution Factor: 1			
	Method.....: SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	0.021 F	0.10	mg/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	102	(74 - 138)

NOTE(S):

F The analyte was identified but the value was below the RL and above the MDL.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

PARSONS Engineering Science, INC.

Client Sample ID: 074-MW-15I-001

GC Volatiles

Lot-Sample #...: D9F260122-006 Work Order #...: CXE2C103 Matrix.....: WATER
Date Sampled...: 06/24/99 14:35 Date Received..: 06/26/99
Prep Date.....: 07/01/99 Analysis Date..: 07/01/99
Prep Batch #...: 9183210 Analysis Time..: 18:31
Dilution Factor: 10

Method.....: SW846 8015 MOD

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	2.6	1.0	mg/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	110	(74 - 138)

NOTE(S):

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

PARSONS Engineering Science, INC.

Client Sample ID: 074-MW-15D-001

GC Volatiles

Lot-Sample #...: D9F260122-005 Work Order #...: CXE28105 Matrix.....: WATER
Date Sampled...: 06/24/99 17:15 Date Received..: 06/26/99
Prep Date.....: 06/30/99 Analysis Date..: 06/30/99
Prep Batch #...: 9182181 Analysis Time..: 15:41
Dilution Factor: 1
Method.....: RSK SOP-175

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methane	4.9 B	0.50	ug/L

NOTE(S):

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

PARSONS Engineering Science, INC.

Client Sample ID: 074-MW-15I-001

GC Volatiles

Lot-Sample #...:	D9F260122-006	Work Order #...:	CXE2C105	Matrix.....:	WATER
Date Sampled...:	06/24/99 14:35	Date Received..:	06/26/99		
Prep Date.....:	06/30/99	Analysis Date..:	06/30/99		
Prep Batch #...:	9182181	Analysis Time..:	15:46		
Dilution Factor:	1				
		Method.....:	RSK SOP-175		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methane	450 B,E	0.50	ug/L

NOTE(S):

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

E Estimated result. Result concentration exceeds the calibration range.

PARSONS Engineering Science, INC.

Client Sample ID: 074-MW-15I-001

GC Volatiles

Lot-Sample #...:	D9F260122-006	Work Order #...:	CXE2C205	Matrix.....:	WATER
Date Sampled...:	06/24/99 14:35	Date Received..:	06/26/99		
Prep Date.....:	07/02/99	Analysis Date..:	07/02/99		
Prep Batch #...:	9183290	Analysis Time..:	09:23		
Dilution Factor:	100				
		Method.....:	RSK SOP-175		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methane	3600 B,D	50	ug/L

NOTE(S):

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

D Result was obtained from the analysis of a dilution.

PARSONS Engineering Science, INC.

Client Sample ID: 074-MW-15D-001

GC Semivolatiles

Lot-Sample #...: D9F260122-005 Work Order #...: CXE28102 Matrix.....: WATER
Date Sampled...: 06/24/99 17:15 Date Received..: 06/26/99
Prep Date.....: 06/29/99 Analysis Date..: 07/09/99
Prep Batch #...: 9180156 Analysis Time..: 21:39
Dilution Factor: 1

Method.....: SW846 8015 MOD

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	ND	1.0	mg/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	66	(57 - 132)
n-Octacosane	56	(26 - 152)

PARSONS Engineering Science, INC.

Client Sample ID: 074-MW-15I-001

GC Semivolatiles

Lot-Sample #...: D9F260122-006 Work Order #...: CXE2C102 Matrix.....: WATER
Date Sampled...: 06/24/99 14:35 Date Received..: 06/26/99
Prep Date.....: 06/29/99 Analysis Date..: 07/09/99
Prep Batch #...: 9180156 Analysis Time..: 21:01
Dilution Factor: 1
Method.....: SW846 8015 MOD

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	0.36 F	1.0	mg/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	61	(57 - 132)
n-Octacosane	57	(26 - 152)

NOTE(S):

F The analyte was identified but the value was below the RL and above the MDL.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

Sample resembles a hydrocarbon product occurring within the n-alkane range of C10 to C28.

PARSONS Engineering Science, INC.

Client Sample ID: 074-SB010-015

General Chemistry

Lot-Sample #...: D9F260122-002 Work Order #...: CXE24 Matrix.....: SOLID
Date Sampled...: 06/23/99 13:00 Date Received..: 06/26/99
% Moisture.....: 14

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Percent Moisture	14.5	0.10	%	ASTM D 2216-90	07/02/99	9184169
		Dilution Factor: 1		Analysis Time..: 21:30		
Total Organic Carbon 1370 B		2000	mg/kg	SW846 9060	07/06-07/07/99	9188340
		Dilution Factor: 1		Analysis Time..: 14:47		

NOTE(S):

RL Reporting Limit

B Estimated result. Result is less than RL.

PARSONS Engineering Science, INC.

Client Sample ID: 074-SB017-024

General Chemistry

Lot-Sample #...: D9F260122-003 Work Order #...: CXE26 Matrix.....: SOLID
Date Sampled...: 06/23/99 18:20 Date Received..: 06/26/99
% Moisture.....: 9.1

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Percent Moisture	9.1	0.10	%	ASTM D 2216-90	07/02/99	9184169
		Dilution Factor: 1		Analysis Time..: 21:30		
Total Organic Carbon	3820	2000	mg/kg	SW846 9060	07/06-07/07/99	9188340
		Dilution Factor: 1		Analysis Time..: 14:51		

PARSONS Engineering Science, INC.

Client Sample ID: 074-SB017-021

General Chemistry

Lot-Sample #...: D9F260122-004 Work Order #...: CXE27 Matrix.....: SOLID
Date Sampled...: 06/23/99 17:20 Date Received..: 06/26/99
% Moisture.....: 16

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Percent Moisture	15.6	0.10	%	ASTM D 2216-90	07/02/99	9184169
		Dilution Factor: 1		Analysis Time..: 21:30		
Total Organic Carbon 1630 B		2000	mg/kg	SW846 9060	07/06-07/07/99	9188340
		Dilution Factor: 1		Analysis Time..: 14:54		

NOTE(S):

RL Reporting Limit

B Estimated result. Result is less than RL.

PARSONS Engineering Science, INC.

Client Sample ID: 074-MW-15D-001

General Chemistry

Lot-Sample #...: D9F260122-005 Work Order #...: CXE28 Matrix.....: WATER
Date Sampled...: 06/24/99 17:15 Date Received..: 06/26/99

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Nitrate-Nitrite	ND	0.10	mg/L	MCAWW 353.2	06/28/99	9179156
		Dilution Factor: 1		Analysis Time..: 07:00		

PARSONS Engineering Science, INC.

Client Sample ID: 074-MW-15I-001

General Chemistry

Lot-Sample #...: D9F260122-006 Work Order #...: CXE2C Matrix.....: WATER
Date Sampled...: 06/24/99 14:35 Date Received..: 06/26/99

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Nitrate-Nitrite	0.015 B	0.10	mg/L	MCAWW 353.2	06/28/99	9179156

Dilution Factor: 1 Analysis Time..: 07:00

NOTE(S):

RL Reporting Limit

B Estimated result. Result is less than RL.

0.9 26758

AnalyticalTechnologies, Inc.
225 COMMERCE DRIVE
FORT COLLINS, CO
80524
(303) 490-1511
(303) 490-1522 FAX
1 (800) 443-1511

Chain of Custody

DATE 6/27/99 PAGE ___ OF ___

ACCESSION NUMBER: ___

PROJECT MANAGER: John Hicks
COMPANY: Parsons
ADDRESS: 1700 Broadway
Suite 900
Denver, CO. 80290
SAMPLER: John Tunks
303 831 8100 PHONE NUMBER
303 831 8208 FAX NUMBER

	SAMPLE ID	SAMPLE DATE	SAMPLE TIME	MATRIX	LAB ID
1	074-TW019I-001	6/22/99	1555	Water	
2	074-SB010-015	6/23/99	1300	Soil	
3	074-SB017-024	"	1820	"	
4	074-SB017-021	"	1720	"	
5	074-MW015D-001	6/24/99	1715	Water	
6	074-MW015I-001	6/24/99	1435	"	
7	Trip Blank			"	

ANALYSIS REQUESTED

9070/9071 — Oil & Grease	418.1 — TRPH	8015 Mod. — Gasoline	8015 Mod. — Diesel	8015/8020 — Gasoline/BTEX	8020 — BTEX	8240 — GC/MS VOC's	8270 — GC/MS SVOC's	8080 — Pesticides/PCB's	8080 — PCB Only	8310 — PNA's	8150 — Herbicides	8140 — OP Pesticides	TOX — EOX — TX	Total Metals:	TCLP:	Gross Alpha	Gross Beta	Radium 226	Radium 228	Tritium	Strontium	% Moisture	BTEX + MTBE/HAP 8260	Total Organic Carbon	Methane, RSK-175	Nitrate			Number of Containers
																							X						3
																								X					1
																								X					1
																								X					1
		X	X																				X		X	X			12
		X	X																				X		X	X			12

PROJECT INFORMATION

PROJECT NUMBER: 734786.003.002
PROJECT NAME: Ecker
PURCHASE ORDER NUMBER:
TAT: ☒ STANDARD ☐ RUSH DUE: ___

SAMPLE RECEIPT

TOTAL NUMBER OF CONTAINERS	
CHAIN OF CUSTODY SEALS Y/N	
SEALS INTACT? Y/N/NA	
RECEIVED GOOD COND./COLD	

SAMPLE DISPOSAL: ☐ HAZ WASTE $5.00 ☐ RAD CHEM $15.00 ☐ RETURN

Comments: See contract for details

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: John Tunks Time: 16:10	Signature: Time:	Signature: Time:
Printed Name: John Tunks Date: 6/25/99	Printed Name: Date:	Printed Name: Date:
Company: Parsons E.S	Company:	Company:
RECEIVED BY: 1.	**RECEIVED BY: 2.**	**RECEIVED BY: 3.**
Signature: Jeff Mott Time: 9:00	Signature: Time:	Signature: Time:
Printed Name: Jeff Mott Date: 6/26/99	Printed Name: Date:	Printed Name: Date:
Company: Quanterra	Company:	Company:

DISTRIBUTION: White, Canary - ANALYTICAL TECHNOLOGIES, INC. • Pink - C

59

Sample Receiving Checklist

Lot #: D9F260122 Date/Time Received: 6-26-99 9:00

Company Name & Sampling Site: PARSONS EAFB AFB

*Cooler #(s): 1

Temperatures: 0.9

Unpacking & Labeling Check Points:

N/A	Yes	No		Initials
	☒	☐	1. Cooler seals intact.	
	☒	☐	2. Chain of custody present.	
	☐	☒	3. Bottles broken and/or are leaking, comment if yes.	
			PHOTOGRAPH BROKEN BOTTLES	
	☒	☐	4. Containers labeled, comment if no.	
	☒	☐	5. pH of all samples checked and meet requirements, note exceptions.	
	☒	☐	6. Chain of custody includes "received by" and "relinquished" by signatures, dates, and times.	
	☒	☐	7. Receipt date(s) > 48 hours past the collection date(s)? If yes, notify PA/PM.	
	☒	☐	8. Chain of custody agrees with bottle count, comment if no.	
	☒	☐	9. Chain of custody agrees with labels, comment if no.	
☐	☒	☐	10. VOA samples filled completely, comment if no.	
☐	☒	☒	11. VOA bottles preserved, check for labels. Some Preserved	
	☐	☒	12. Did samples require preservation with sodium thiosulfate?	
☒	☐	☐	13. If yes to #12, did the samples contain residual chlorine?	
☒	☐	☐	14. Sediment present in "D," dissolved, bottles.	
	☐	☒	15. Are analyses with short holding times requested?	
☒	☐	☐	16. Is extra sample volume provided for MS, MSD or matrix duplicates?	
	☐	☒	17. Multiphase samples present? If yes, comment below.	
	☐	☒	18. Any subsampling for volatiles? If yes, list samples.	
			PHOTOGRAPH MULTIPHASE SAMPLES	
☒	☐	☐	19. Clear picture taken, labeled, and stapled to project folder.	
☒	☐	☐	20. Subcontract COC signed and sent with samples to bottle prep?	
	☐	☐	21. Was sample labeling double checked by a second person?	

Document any problems or discrepancies and the actions taken to resolve them on a Condition Upon Receipt Anomaly Report (CUR)

Quanterra Incorporated
4955 Yarrow Street
Arvada, Colorado 80002

303 421-6611 Telephone
303 431-7171 Fax

ANALYTICAL REPORT

Eaker AFB
734786.03000

Lot #: D9F290171

John Hicks

Parsons Engineering Services

QUANTERRA INCORPORATED



Dan Moore
Project Manager

July 15, 1999

Project Narrative
(D9F290171)

With exceptions noted below and on the data sheets, standard analytical protocols were followed in the analyses of the samples and no problems were encountered or anomalies observed. All laboratory quality control samples analyzed in conjunction with the samples in this project were within acceptable limits.

GC/MS Volatiles

Sample D9F290171-001 (and MS/MSD), 002 and 003 were analyzed diluted due to the presence of target analytes.

Sample D9F290171-007 demonstrated a high recovery for the surrogate, dibromofluoromethane due to the presence of non-targetanalyte interference.

GC Volatiles – GRO

Sample D9F290171-001 was analyzed diluted due to the presence of target analytes.

The MS/MSD analysis was not performed on sample 001 as requested. The analyst accidentally spiked sample 005. The MS/MSD data is included for 005. There was no hold-time remaining to analyze 001 as an MS/MSD.

GC Semi-volatiles – DRO

Sample D9F290171-007 demonstrated a low surrogate recovery for o-terphenyl. The octocosane recovery was within QC limits. The sample does not contain measurable quantities of DRO, therefore the sample data was accepted and reported.

EXECUTIVE SUMMARY - Detection Highlights

D9F290171

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
074-MW013-001 06/25/99 13:50 001				
Diesel Range Organics	1.2	1.0	mg/L	SW846 8015 MOD
Methane	2400 B,D	25	ug/L	RSK SOP-175
Methane	380 B,E	0.50	ug/L	RSK SOP-175
Gasoline Range Organics	13 B	2.5	mg/L	SW846 8015 MOD
Benzene	350	25	ug/L	SW846 8260B
Ethylbenzene	650	30	ug/L	SW846 8260B
Naphthalene	99	50	ug/L	SW846 8260B
Toluene	120	55	ug/L	SW846 8260B
1,2,4-Trimethylbenzene	340	65	ug/L	SW846 8260B
m-Xylene & p-Xylene	1600	50	ug/L	SW846 8260B
o-Xylene	420	55	ug/L	SW846 8260B
Nitrate-Nitrite	0.025 B	0.10	mg/L	MCAWW 353.2
074-MW013-101 06/25/99 14:05 002				
Diesel Range Organics	1.1	1.0	mg/L	SW846 8015 MOD
Methane	390 B,E	0.50	ug/L	RSK SOP-175
Methane	2400 B,D	50	ug/L	RSK SOP-175
Gasoline Range Organics	11 B	2.5	mg/L	SW846 8015 MOD
Benzene	400	25	ug/L	SW846 8260B
Ethylbenzene	780	30	ug/L	SW846 8260B
Naphthalene	120	50	ug/L	SW846 8260B
Toluene	130	55	ug/L	SW846 8260B
1,2,4-Trimethylbenzene	410	65	ug/L	SW846 8260B
m-Xylene & p-Xylene	2000	50	ug/L	SW846 8260B
o-Xylene	500	55	ug/L	SW846 8260B
Nitrate-Nitrite	0.030 B	0.10	mg/L	MCAWW 353.2
074-MW012-003 06/26/99 10:20 003				
Methane	430 B,E	0.50	ug/L	RSK SOP-175
Methane	11000 B,D	150	ug/L	RSK SOP-175
Benzene	6400	120	ug/L	SW846 8260B
Ethylbenzene	620	150	ug/L	SW846 8260B
Methyl tert-butyl ether	580 F	1200	ug/L	SW846 8260B
Naphthalene	250	250	ug/L	SW846 8260B
Toluene	150 F	280	ug/L	SW846 8260B
1,2,4-Trimethylbenzene	45 F	320	ug/L	SW846 8260B
m-Xylene & p-Xylene	390	250	ug/L	SW846 8260B
o-Xylene	70 F	280	ug/L	SW846 8260B

(Continued on next page)

EXECUTIVE SUMMARY - Detection Highlights

D9F290171

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
074-MW016-001 06/26/99 12:55 004				
Methane	8.1 B	0.50	ug/L	RSK SOP-175
Gasoline Range Organics	0.12 B	0.10	mg/L	SW846 8015 MOD
Naphthalene	0.41 F	1.0	ug/L	SW846 8260B
074-MW017-001 06/26/99 17:00 005				
Methane	51 B	0.50	ug/L	RSK SOP-175
Gasoline Range Organics	0.014 F,B	0.10	mg/L	SW846 8015 MOD
Benzene	0.73	0.50	ug/L	SW846 8260B
Methyl tert-butyl ether	1.7 F	5.0	ug/L	SW846 8260B
074-MW018-001 06/26/99 15:20 006				
Methane	1.4 B	0.50	ug/L	RSK SOP-175
Gasoline Range Organics	0.014 F,B	0.10	mg/L	SW846 8015 MOD
074-MW014-001 06/25/99 10:25 007				
Methane	8.8 B	0.50	ug/L	RSK SOP-175
Gasoline Range Organics	0.13 B	0.10	mg/L	SW846 8015 MOD

ANALYTICAL METHODS SUMMARY

D9F290171

PARAMETER	ANALYTICAL METHOD
Dissolved Gases in Water	RSK SOP-175
Extractable Petroleum Hydrocarbons	SW846 8015 MOD
Nitrate-Nitrite	MCAWW 353.2
Volatile Organics by GC/MS	SW846 8260B
Volatile Petroleum Hydrocarbons	SW846 8015 MOD

References:

MCAWW "Methods for Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983 and subsequent revisions.

RSK Sample Prep and Calculations for Dissolved Gas Analysis in Water Samples Using a GC Headspace Equilibration Technique, RSKSOP-175, REV. 0, 8/11/94, USEPA Research Lab

SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

SAMPLE SUMMARY

D9F290171

WO #	SAMPLE#	CLIENT SAMPLE ID	DATE	TIME
CXGFM	001	074-MW013-001	06/25/99	13:50
CXGGF	002	074-MW013-101	06/25/99	14:05
CXGGK	003	074-MW012-003	06/26/99	10:20
CXGH0	004	074-MW016-001	06/26/99	12:55
CXGHJ	005	074-MW017-001	06/26/99	17:00
CXGHP	006	074-MW018-001	06/26/99	15:20
CXGHT	007	074-MW014-001	06/25/99	10:25
CXGHX	008	TRIP BLANK 1	06/28/99	08:00
CXGJF	009	TRIP BLANK 2	06/28/99	08:00
CXGJG	010	TRIP BLANK 3	06/28/99	08:00

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

PARSONS Engineering Science, INC.

Client Sample ID: 074-MW013-001

GC/MS Volatiles

Lot-Sample #...: D9F290171-001	**Work Order #...:** CXGFM101	**Matrix.....:** WG	
Date Sampled...: 06/25/99 13:50	**Date Received..:** 06/29/99		
Prep Date.....: 07/01/99	**Analysis Date..:** 07/01/99		
Prep Batch #...: 9189411	**Analysis Time..:** 12:24		
Dilution Factor: 50			
	Method.....: SW846 8260B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	**350**	**25**	**ug/L**
Ethylbenzene	**650**	**30**	**ug/L**
Methyl tert-butyl ether	ND	250	ug/L
Naphthalene	**99**	**50**	**ug/L**
Toluene	**120**	**55**	**ug/L**
1,2,4-Trimethylbenzene	**340**	**65**	**ug/L**
1,3,5-Trimethylbenzene	ND	25	ug/L
m-Xylene & p-Xylene	**1600**	**50**	**ug/L**
o-Xylene	**420**	**55**	**ug/L**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	102	(75 - 125)
Toluene-d8	100	(75 - 125)
4-Bromofluorobenzene	98	(75 - 125)
1,2-Dichloroethane-d4	93	(62 - 139)

PARSONS Engineering Science, INC.

Client Sample ID: 074-MW013-101

GC/MS Volatiles

Lot-Sample #...: D9F290171-002 Work Order #...: CXGGF101 Matrix.....: WG
Date Sampled...: 06/25/99 14:05 Date Received..: 06/29/99
Prep Date.....: 07/01/99 Analysis Date..: 07/01/99
Prep Batch #...: 9189411 Analysis Time..: 12:46
Dilution Factor: 50

Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	**400**	**25**	**ug/L**
Ethylbenzene	**780**	**30**	**ug/L**
Methyl tert-butyl ether	ND	250	ug/L
Naphthalene	**120**	**50**	**ug/L**
Toluene	**130**	**55**	**ug/L**
1,2,4-Trimethylbenzene	**410**	**65**	**ug/L**
1,3,5-Trimethylbenzene	ND	25	ug/L
m-Xylene & p-Xylene	**2000**	**50**	**ug/L**
o-Xylene	**500**	**55**	**ug/L**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	101	(75 - 125)
Toluene-d8	100	(75 - 125)
4-Bromofluorobenzene	99	(75 - 125)
1,2-Dichloroethane-d4	94	(62 - 139)

PARSONS Engineering Science, INC.

Client Sample ID: 074-MW012-003

GC/MS Volatiles

Lot-Sample #...: D9F290171-003 Work Order #...: CXGGK101 Matrix.....: WG
Date Sampled...: 06/26/99 10:20 Date Received..: 06/29/99
Prep Date.....: 07/01/99 Analysis Date..: 07/01/99
Prep Batch #...: 9189411 Analysis Time..: 13:09
Dilution Factor: 250

Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	6400	120	ug/L
Ethylbenzene	620	150	ug/L
Methyl tert-butyl ether	580 F	1200	ug/L
Naphthalene	250	250	ug/L
Toluene	150 F	280	ug/L
1,2,4-Trimethylbenzene	45 F	320	ug/L
1,3,5-Trimethylbenzene	ND	120	ug/L
m-Xylene & p-Xylene	390	250	ug/L
o-Xylene	70 F	280	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	106	(75 - 125)
Toluene-d8	99	(75 - 125)
4-Bromofluorobenzene	104	(75 - 125)
1,2-Dichloroethane-d4	98	(62 - 139)

NOTE(S):

F The analyte was identified but the value was below the RL and above the MDL.

PARSONS Engineering Science, INC.

Client Sample ID: 074-MW016-001

GC/MS Volatiles

Lot-Sample #...: D9F290171-004 Work Order #...: CXGH0101 Matrix.....: WG
Date Sampled...: 06/26/99 12:55 Date Received..: 06/29/99
Prep Date.....: 07/01/99 Analysis Date..: 07/01/99
Prep Batch #...: 9189411 Analysis Time..: 13:31
Dilution Factor: 1
Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	ND	0.50	ug/L
Ethylbenzene	ND	0.60	ug/L
Naphthalene	**0.41 F**	**1.0**	**ug/L**
Toluene	ND	1.1	ug/L
o-Xylene	ND	1.1	ug/L
Methyl tert-butyl ether	ND	5.0	ug/L
m-Xylene & p-Xylene	ND	1.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	93	(75 - 125)
Toluene-d8	102	(75 - 125)
4-Bromofluorobenzene	93	(75 - 125)
1,2-Dichloroethane-d4	95	(62 - 139)

NOTE(S):

F The analyte was identified but the value was below the RL and above the MDL.

PARSONS Engineering Science, INC.

Client Sample ID: 074-MW017-001

GC/MS Volatiles

Lot-Sample #...: D9F290171-005 Work Order #...: CXGHJ101 Matrix.....: WG
Date Sampled...: 06/26/99 17:00 Date Received..: 06/29/99
Prep Date.....: 07/01/99 Analysis Date..: 07/01/99
Prep Batch #...: 9189411 Analysis Time..: 13:54
Dilution Factor: 1

Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	**0.73**	**0.50**	**ug/L**
Ethylbenzene	ND	0.60	ug/L
Naphthalene	ND	1.0	ug/L
Toluene	ND	1.1	ug/L
o-Xylene	ND	1.1	ug/L
Methyl tert-butyl ether	**1.7 F**	**5.0**	**ug/L**
m-Xylene & p-Xylene	ND	1.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	106	(75 - 125)
Toluene-d8	100	(75 - 125)
4-Bromofluorobenzene	104	(75 - 125)
1,2-Dichloroethane-d4	97	(62 - 139)

NOTE(S):

F The analyte was identified but the value was below the RL and above the MDL.

PARSONS Engineering Science, INC.

Client Sample ID: 074-MW018-001

GC/MS Volatiles

Lot-Sample #...: D9F290171-006 **Work Order #...:** CXGHP101 **Matrix.....:** WG
Date Sampled...: 06/26/99 15:20 **Date Received..:** 06/29/99
Prep Date.....: 07/01/99 **Analysis Date..:** 07/01/99
Prep Batch #...: 9189411 **Analysis Time..:** 14:16
Dilution Factor: 1

Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	ND	0.50	ug/L
Ethylbenzene	ND	0.60	ug/L
Naphthalene	ND	1.0	ug/L
Toluene	ND	1.1	ug/L
o-Xylene	ND	1.1	ug/L
Methyl tert-butyl ether	ND	5.0	ug/L
m-Xylene & p-Xylene	ND	1.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	109	(75 - 125)
Toluene-d8	100	(75 - 125)
4-Bromofluorobenzene	105	(75 - 125)
1,2-Dichloroethane-d4	101	(62 - 139)

PARSONS Engineering Science, INC.

Client Sample ID: 074-MW014-001

GC/MS Volatiles

Lot-Sample #...: D9F290171-007 Work Order #...: CXGHT101 Matrix.....: WG
Date Sampled...: 06/25/99 10:25 Date Received..: 06/29/99
Prep Date.....: 07/01/99 Analysis Date..: 07/01/99
Prep Batch #...: 9189411 Analysis Time..: 14:39
Dilution Factor: 1

Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	ND	0.50	ug/L
Ethylbenzene	ND	0.60	ug/L
Methyl tert-butyl ether	ND	5.0	ug/L
m-Xylene & p-Xylene	ND	1.0	ug/L
Naphthalene	ND	1.0	ug/L
Toluene	ND	1.1	ug/L
o-Xylene	ND	1.1	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	138 *	(75 - 125)
Toluene-d8	107	(75 - 125)
4-Bromofluorobenzene	96	(75 - 125)
1,2-Dichloroethane-d4	128	(62 - 139)

NOTE(S):

* Surrogate recovery is outside stated control limits.

PARSONS Engineering Science, INC.

Client Sample ID: TRIP BLANK 1

GC/MS Volatiles

Lot-Sample #...: D9F290171-008 **Work Order #...:** CXGHX101 **Matrix.....:** WG
Date Sampled...: 06/28/99 08:00 **Date Received..:** 06/29/99
Prep Date.....: 07/01/99 **Analysis Date..:** 07/01/99
Prep Batch #...: 9189411 **Analysis Time..:** 15:02
Dilution Factor: 1

Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	ND	0.50	ug/L
Ethylbenzene	ND	0.60	ug/L
Methyl tert-butyl ether	ND	5.0	ug/L
Naphthalene	ND	1.0	ug/L
Toluene	ND	1.1	ug/L
1,2,4-Trimethylbenzene	ND	1.3	ug/L
1,3,5-Trimethylbenzene	ND	0.50	ug/L
m-Xylene & p-Xylene	ND	1.0	ug/L
o-Xylene	ND	1.1	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	106	(75 - 125)
Toluene-d8	100	(75 - 125)
4-Bromofluorobenzene	102	(75 - 125)
1,2-Dichloroethane-d4	97	(62 - 139)

PARSONS Engineering Science, INC.

Client Sample ID: TRIP BLANK 2

GC/MS Volatiles

Lot-Sample #...: D9F290171-009 Work Order #...: CXGJF101 Matrix.....: WG
Date Sampled...: 06/28/99 08:00 Date Received..: 06/29/99
Prep Date.....: 07/01/99 Analysis Date..: 07/01/99
Prep Batch #...: 9189411 Analysis Time..: 15:25
Dilution Factor: 1

Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	ND	0.50	ug/L
Ethylbenzene	ND	0.60	ug/L
Methyl tert-butyl ether	ND	5.0	ug/L
Naphthalene	ND	1.0	ug/L
Toluene	ND	1.1	ug/L
1,2,4-Trimethylbenzene	ND	1.3	ug/L
1,3,5-Trimethylbenzene	ND	0.50	ug/L
m-Xylene & p-Xylene	ND	1.0	ug/L
o-Xylene	ND	1.1	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	111	(75 - 125)
Toluene-d8	101	(75 - 125)
4-Bromofluorobenzene	99	(75 - 125)
1,2-Dichloroethane-d4	105	(62 - 139)

PARSONS Engineering Science, INC.

Client Sample ID: TRIP BLANK 3

GC/MS Volatiles

Lot-Sample #...: D9F290171-010 **Work Order #...:** CXGJG101 **Matrix.....:** WG
Date Sampled...: 06/28/99 08:00 **Date Received..:** 06/29/99
Prep Date.....: 07/01/99 **Analysis Date..:** 07/01/99
Prep Batch #...: 9189411 **Analysis Time..:** 15:47
Dilution Factor: 1
Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	ND	0.50	ug/L
Ethylbenzene	ND	0.60	ug/L
Methyl tert-butyl ether	ND	5.0	ug/L
Naphthalene	ND	1.0	ug/L
Toluene	ND	1.1	ug/L
1,2,4-Trimethylbenzene	ND	1.3	ug/L
1,3,5-Trimethylbenzene	ND	0.50	ug/L
m-Xylene & p-Xylene	ND	1.0	ug/L
o-Xylene	ND	1.1	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	107	(75 - 125)
Toluene-d8	101	(75 - 125)
4-Bromofluorobenzene	101	(75 - 125)
1,2-Dichloroethane-d4	100	(62 - 139)

PARSONS Engineering Science, INC.

Client Sample ID: 074-MW013-001

GC Volatiles

Lot-Sample #...: D9F290171-001 Work Order #...: CXGFM103 Matrix.....: WG
Date Sampled...: 06/25/99 13:50 Date Received..: 06/29/99
Prep Date.....: 07/08/99 Analysis Date..: 07/08/99
Prep Batch #...: 9191144 Analysis Time..: 17:53
Dilution Factor: 25
Method.....: SW846 8015 MOD

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	13 B	2.5	mg/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	99	(74 - 138)

NOTE(S):

This sample has GC/FID characteristics that are similar to gasoline.

B The analyte was found in the associated blank, as well as in the sample.

PARSONS Engineering Science, INC.

Client Sample ID: 074-MW013-101

GC Volatiles

Lot-Sample #...: D9F290171-002	Work Order #...: CXGGF103	Matrix.....: WG	
Date Sampled...: 06/25/99 14:05	Date Received..: 06/29/99		
Prep Date.....: 07/08/99	Analysis Date..: 07/08/99		
Prep Batch #...: 9191144	Analysis Time..: 18:37		
Dilution Factor: 25			
	Method.....: SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	11 B	2.5	mg/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	105	(74 - 138)

NOTE(S):

This sample has GC/FID characteristics that are similar to gasoline.

B The analyte was found in the associated blank, as well as in the sample.

PARSONS Engineering Science, INC.

Client Sample ID: 074-MW016-001

GC Volatiles

Lot-Sample #...: D9F290171-004 Work Order #...: CXGH0103 Matrix.....: WG
Date Sampled...: 06/26/99 12:55 Date Received..: 06/29/99
Prep Date.....: 07/08/99 Analysis Date..: 07/08/99
Prep Batch #...: 9191144 Analysis Time..: 19:22
Dilution Factor: 1

Method.....: SW846 8015 MOD

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	0.12 B	0.10	mg/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	105	(74 - 138)

NOTE(S):

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

B The analyte was found in the associated blank, as well as in the sample.

PARSONS Engineering Science, INC.

Client Sample ID: 074-MW017-001

GC Volatiles

Lot-Sample #...: D9F290171-005 Work Order #...: CXGHJ103 Matrix.....: WG
Date Sampled...: 06/26/99 17:00 Date Received..: 06/29/99
Prep Date.....: 07/08/99 Analysis Date..: 07/08/99
Prep Batch #...: 9191144 Analysis Time..: 15:39
Dilution Factor: 1
Method.....: SW846 8015 MOD

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	0.014 F,B	0.10	mg/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	102	(74 - 138)

NOTE(S):

F The analyte was identified but the value was below the RL and above the MDL.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

B The analyte was found in the associated blank, as well as in the sample.

PARSONS Engineering Science, INC.

Client Sample ID: 074-MW018-001

GC Volatiles

Lot-Sample #...: D9F290171-006 Work Order #...: CXGHP103 Matrix.....: WG
Date Sampled...: 06/26/99 15:20 Date Received..: 06/29/99
Prep Date.....: 07/08/99 Analysis Date..: 07/08/99
Prep Batch #...: 9191144 Analysis Time..: 20:07
Dilution Factor: 1

Method.....: SW846 8015 MOD

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	0.014 F,B	0.10	mg/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	103	(74 - 138)

NOTE(S):

F The analyte was identified but the value was below the RL and above the MDL.
This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

B The analyte was found in the associated blank, as well as in the sample.

PARSONS Engineering Science, INC.

Client Sample ID: 074-MW014-001

GC Volatiles

Lot-Sample #...: D9F290171-007	Work Order #...: CXGHT103	Matrix.....: WG	
Date Sampled...: 06/25/99 10:25	Date Received..: 06/29/99		
Prep Date.....: 07/08/99	Analysis Date..: 07/08/99		
Prep Batch #...: 9191144	Analysis Time..: 20:51		
Dilution Factor: 1			
	Method.....: SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Gasoline Range Organics	0.13 B	0.10	mg/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene	363 *	(74 - 138)

NOTE(S):

* Surrogate recovery is outside stated control limits.

The surrogate recovery in the sample is outside control limits due to confirmed matrix effect.

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

B The analyte was found in the associated blank, as well as in the sample.

PARSONS Engineering Science, INC.

Client Sample ID: 074-MW013-001

GC Volatiles

Lot-Sample #...: D9F290171-001 Work Order #...: CXGFM205 Matrix.....: WG
Date Sampled...: 06/25/99 13:50 Date Received..: 06/29/99
Prep Date.....: 07/02/99 Analysis Date..: 07/02/99
Prep Batch #...: 9183290 Analysis Time..: 09:40
Dilution Factor: 1

Method.....: RSK SOP-175

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methane	380 B,E	0.50	ug/L

NOTE(S):

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

E Estimated result. Result concentration exceeds the calibration range.

PARSONS Engineering Science, INC.

Client Sample ID: 074-MW013-001

GC Volatiles

Lot-Sample #...:	D9F290171-001	Work Order #...:	CXGFM105	Matrix.....:	WG
Date Sampled...:	06/25/99 13:50	Date Received..:	06/29/99		
Prep Date.....:	07/02/99	Analysis Date..:	07/02/99		
Prep Batch #...:	9183290	Analysis Time..:	10:45		
Dilution Factor:	50				
		Method.....:	RSK SOP-175		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methane	2400 B,D	25	ug/L

NOTE(S):

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

D Result was obtained from the analysis of a dilution.

PARSONS Engineering Science, INC.

Client Sample ID: 074-MW013-101

GC Volatiles

Lot-Sample #...: D9F290171-002 Work Order #...: CXGGF105 Matrix.....: WG
Date Sampled...: 06/25/99 14:05 Date Received..: 06/29/99
Prep Date.....: 07/02/99 Analysis Date..: 07/02/99
Prep Batch #...: 9183290 Analysis Time..: 09:47
Dilution Factor: 1

Method.....: RSK SOP-175

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methane	390 B,E	0.50	ug/L

NOTE(S):

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

E Estimated result. Result concentration exceeds the calibration range.

PARSONS Engineering Science, INC.

Client Sample ID: 074-MW013-101

GC Volatiles

Lot-Sample #...:	D9F290171-002	Work Order #...:	CXGGF205	Matrix.....:	WG
Date Sampled...:	06/25/99 14:05	Date Received..:	06/29/99		
Prep Date.....:	07/02/99	Analysis Date..:	07/02/99		
Prep Batch #...:	9183290	Analysis Time..:	11:07		
Dilution Factor:	100				
		Method.....:	RSK SOP-175		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methane	2400 B,D	50	ug/L

NOTE(S):

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

D Result was obtained from the analysis of a dilution.

PARSONS Engineering Science, INC.

Client Sample ID: 074-MW012-003

GC Volatiles

Lot-Sample #...:	D9F290171-003	Work Order #...:	CXGGK102	Matrix.....:	WG
Date Sampled...:	06/26/99 10:20	Date Received..:	06/29/99		
Prep Date.....:	07/02/99	Analysis Date..:	07/02/99		
Prep Batch #...:	9183290	Analysis Time..:	09:53		
Dilution Factor:	1				
		Method.....:	RSK SOP-175		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methane	430 B,E	0.50	ug/L

NOTE(S):

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

E Estimated result. Result concentration exceeds the calibration range.

PARSONS Engineering Science, INC.

Client Sample ID: 074-MW012-003

GC Volatiles

Lot-Sample #...:	D9F290171-003	Work Order #...:	CXGGK202	Matrix.....:	WG
Date Sampled...:	06/26/99 10:20	Date Received..:	06/29/99		
Prep Date.....:	07/02/99	Analysis Date..:	07/02/99		
Prep Batch #...:	9183290	Analysis Time..:	11:19		
Dilution Factor:	300				
		Method.....:	RSK SOP-175		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methane	11000 B,D	150	ug/L

NOTE(S):

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

D Result was obtained from the analysis of a dilution.

PARSONS Engineering Science, INC.

Client Sample ID: 074-MW016-001

GC Volatiles

Lot-Sample #...:	D9F290171-004	Work Order #...:	CXGH0105	Matrix.....:	WG
Date Sampled...:	06/26/99 12:55	Date Received..:	06/29/99		
Prep Date.....:	07/02/99	Analysis Date..:	07/02/99		
Prep Batch #...:	9183290	Analysis Time..:	10:00		
Dilution Factor:	1				
		Method.....:	RSK SOP-175		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methane	8.1 B	0.50	ug/L

NOTE(S):

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

PARSONS Engineering Science, INC.

Client Sample ID: 074-MW017-001

GC Volatiles

Lot-Sample #...:	D9F290171-005	Work Order #...:	CXGHJ105	Matrix.....:	WG
Date Sampled...:	06/26/99 17:00	Date Received..:	06/29/99		
Prep Date.....:	07/02/99	Analysis Date..:	07/02/99		
Prep Batch #...:	9183290	Analysis Time..:	10:08		
Dilution Factor:	1				
		Method.....:	RSK SOP-175		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methane	51 B	0.50	ug/L

NOTE(S):

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

PARSONS Engineering Science, INC.

Client Sample ID: 074-MW018-001

GC Volatiles

Lot-Sample #...:	D9F290171-006	Work Order #...:	CXGHP105	Matrix.....:	WG
Date Sampled...:	06/26/99 15:20	Date Received..:	06/29/99		
Prep Date.....:	07/02/99	Analysis Date..:	07/02/99		
Prep Batch #...:	9183290	Analysis Time..:	10:17		
Dilution Factor:	1				
		Method.....:	RSK SOP-175		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methane	1.4 B	0.50	ug/L

NOTE(S):

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

PARSONS Engineering Science, INC.

Client Sample ID: 074-MW014-001

GC Volatiles

Lot-Sample #...:	D9F290171-007	Work Order #...:	CXGHT105	Matrix.....:	WG
Date Sampled...:	06/25/99 10:25	Date Received..:	06/29/99		
Prep Date.....:	07/02/99	Analysis Date..:	07/02/99		
Prep Batch #...:	9183290	Analysis Time..:	10:25		
Dilution Factor:	1				
		Method.....:	RSK SOP-175		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methane	8.8 B	0.50	ug/L

NOTE(S):

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

PARSONS Engineering Science, INC.

Client Sample ID: 074-MW013-001

GC Semivolatiles

Lot-Sample #...: D9F290171-001	Work Order #...: CXGFM102	Matrix.....: WG	
Date Sampled...: 06/25/99 13:50	Date Received..: 06/29/99		
Prep Date.....: 06/30/99	Analysis Date..: 07/08/99		
Prep Batch #...: 9181219	Analysis Time..: 02:34		
Dilution Factor: 1			
	Method.....: SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	1.2	1.0	mg/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	63	(57 - 132)
n-Octacosane	57	(26 - 152)

NOTE(S):

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

Sample resembles a hydrocarbon product occurring within the n-alkane range of C10 to C16.

PARSONS Engineering Science, INC.

Client Sample ID: 074-MW013-101

GC Semivolatiles

Lot-Sample #...: D9F290171-002	Work Order #...: CXGGF102	Matrix.....: WG	
Date Sampled...: 06/25/99 14:05	Date Received..: 06/29/99		
Prep Date.....: 06/30/99	Analysis Date..: 07/08/99		
Prep Batch #...: 9181219	Analysis Time..: 04:28		
Dilution Factor: 1			
	Method.....: SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	1.1	1.0	mg/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	63	(57 - 132)
n-Octacosane	58	(26 - 152)

NOTE(S):

This sample has GC/FID characteristics for which reliable identification of a product could not be achieved.

Sample resembles a hydrocarbon product occurring within the n-alkane range of C10 to C16.

PARSONS Engineering Science, INC.

Client Sample ID: 074-MW016-001

GC Semivolatiles

Lot-Sample #...:	D9F290171-004	**Work Order #...:**	CXGH0102	**Matrix.....:**	WG
Date Sampled...:	06/26/99 12:55	**Date Received..:**	06/29/99		
Prep Date.....:	06/30/99	**Analysis Date..:**	07/08/99		
Prep Batch #...:	9181219	**Analysis Time..:**	07:00		
Dilution Factor:	1				
		Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	ND	1.0	mg/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	62	(57 - 132)
n-Octacosane	52	(26 - 152)

PARSONS Engineering Science, INC.

Client Sample ID: 074-MW017-001

GC Semivolatiles

Lot-Sample #...:	D9F290171-005	**Work Order #...:**	CXGHJ102	**Matrix.....:**	WG
Date Sampled...:	06/26/99 17:00	**Date Received..:**	06/29/99		
Prep Date.....:	06/30/99	**Analysis Date..:**	07/08/99		
Prep Batch #...:	9181219	**Analysis Time..:**	05:06		
Dilution Factor:	1				
		Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	ND	1.0	mg/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	64	(57 - 132)
n-Octacosane	61	(26 - 152)

PARSONS Engineering Science, INC.

Client Sample ID: 074-MW018-001

GC Semivolatiles

Lot-Sample #...:	D9F290171-006	**Work Order #...:**	CXGHP102	**Matrix.....:**	WG
Date Sampled...:	06/26/99 15:20	**Date Received..:**	06/29/99		
Prep Date.....:	06/30/99	**Analysis Date..:**	07/08/99		
Prep Batch #...:	9181219	**Analysis Time..:**	05:44		
Dilution Factor:	1				
		Method.....:	SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	ND	1.0	mg/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	66	(57 - 132)
n-Octacosane	50	(26 - 152)

PARSONS Engineering Science, INC.

Client Sample ID: 074-MW014-001

GC Semivolatiles

Lot-Sample #...: D9F290171-007	**Work Order #...:** CXGHT102	**Matrix.....:** WG	
Date Sampled...: 06/25/99 10:25	**Date Received..:** 06/29/99		
Prep Date.....: 06/30/99	**Analysis Date..:** 07/08/99		
Prep Batch #...: 9181219	**Analysis Time..:** 06:22		
Dilution Factor: 1			
	Method.....: SW846 8015 MOD		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diesel Range Organics	ND	1.0	mg/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
o-Terphenyl	35 *	(57 - 132)
n-Octacosane	29	(26 - 152)

NOTE(S):

* Surrogate recovery is outside stated control limits.

PARSONS Engineering Science, INC.

Client Sample ID: 074-MW013-001

General Chemistry

Lot-Sample #...: D9F290171-001 Work Order #...: CXGFM Matrix.....: WG
Date Sampled...: 06/25/99 13:50 Date Received..: 06/29/99

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Nitrate-Nitrite	0.025 B	0.10	mg/L	MCAWW 353.2	06/30/99	9181163

Dilution Factor: 1 Analysis Time..: 07:00

NOTE(S):

RL Reporting Limit

B Estimated result. Result is less than RL.

PARSONS Engineering Science, INC.

Client Sample ID: 074-MW013-101

General Chemistry

Lot-Sample #...: D9F290171-002 Work Order #...: CXGGF Matrix.....: WG
Date Sampled...: 06/25/99 14:05 Date Received..: 06/29/99

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Nitrate-Nitrite	0.030 B	0.10	mg/L	MCAWW 353.2	06/30/99	9181163
	Dilution Factor: 1			Analysis Time..: 07:00		

NOTE(S):

RL Reporting Limit

B Estimated result. Result is less than RL.

PARSONS Engineering Science, INC.

Client Sample ID: 074-MW016-001

General Chemistry

Lot-Sample #...: D9F290171-004 Work Order #...: CXGH0 Matrix.....: WG
Date Sampled...: 06/26/99 12:55 Date Received..: 06/29/99

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Nitrate-Nitrite	ND	0.10	mg/L	MCAWW 353.2	06/30/99	9181163

Dilution Factor: 1 Analysis Time..: 07:00

PARSONS Engineering Science, INC.

Client Sample ID: 074-MW017-001

General Chemistry

Lot-Sample #...: D9F290171-005 Work Order #...: CXGHJ Matrix.....: WG
Date Sampled...: 06/26/99 17:00 Date Received..: 06/29/99

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Nitrate-Nitrite	ND	0.10	mg/L	MCAWW 353.2	06/30/99	9181163

Dilution Factor: 1 Analysis Time..: 07:00

PARSONS Engineering Science, INC.

Client Sample ID: 074-MW018-001

General Chemistry

Lot-Sample #...: D9F290171-006 **Work Order #...:** CXGHP **Matrix.....:** WG
Date Sampled...: 06/26/99 15:20 **Date Received..:** 06/29/99

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Nitrate-Nitrite	ND	0.10	mg/L	MCAWW 353.2	06/30/99	9181163

Dilution Factor: 1 Analysis Time..: 07:00

PARSONS Engineering Science, INC.

Client Sample ID: 074-MW014-001

General Chemistry

Lot-Sample #...: D9F290171-007 Work Order #...: CXGHT Matrix.....: WG
Date Sampled...: 06/25/99 10:25 Date Received..: 06/29/99

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Nitrate-Nitrite	ND	0.10	mg/L	MCAWW 353.2	06/30/99	9181163

Dilution Factor: 1 Analysis Time..: 07:00

Chain of Custody Record

0.5 2.9 2.9

Quanterra

26758

QUA-4124 0797

Client: Parsons ES	Project Manager: John Hicks	Date: ~~6/25/99~~ 6/28/99	Chain of Custody Number: 23379
Address: 1700 Broadway Suite 900	Telephone Number (Area Code)/Fax Number: 303 831 8100 / 303 831 8208	Lab Number:	Page 1 of 1
City: Denver; State: CO; Zip Code: 80290	Site Contact: John Tunks	Lab Contact: Dan Moore	
Project Name: Ealker	Carrier/Waybill Number: ~~8087231134178~~ 808723113429 Fed Ex		
Contract/Purchase Order/Quote No.: 734786.03000			

	Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Analysis: TMB 8260	BTEX/MTBE/NAP	Methane	GRO	DRO	Nitrate
1	074-MW013-001	6/25/99	1350	✓			5		1	6			✓		✓	✓	✓	✓
2	074-MW013-101	6/25/99	1405	✓			5		1	6			✓		✓	✓	✓	✓
	074-MW013-001-MS	6/25/99	1420	✓			5		1	6			✓		✓	✓	✓	✓
	074-MW013-001-MSD	6/25/99	1435	✓			5		1	6			✓		✓	✓	✓	✓
3	074-MW012-003	6/26/99	1020	✓						6			✓	✓	✓			
4	074-MW016-001	6/26/99	1255	✓			2		1	9				✓	✓	✓	✓	✓
5	074-MW017-001	6/26/99	1700	✓			2		1	9				✓	✓	✓	✓	✓
6	074-MW018-001	6/26/99	1520	✓			2		1	9				✓	✓	✓	✓	✓
8	Trip Blank Cooler 1 of 3	6/28/99	0800	✓						1			✓	✓	✓			
	Trip Blank Cooler 2 of 3	6/28/99	0800	✓						1			✓	✓	✓			
Ignore cross out	Trip Blank Cooler 3 of 3	6/28/99	0800	✓						1			✓	✓	✓			
9 or 7	~~074-MW014-001~~	~~6/25/99~~	1025	✓			5		1	6					✓	✓	✓	✓

Special Instructions/ Conditions of Receipt

~~all other analyses in contract~~

See contract for methods

ignore this cross out G.T.

Possible Hazard Identification

☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal

☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months (A fee may be assessed if samples are retained longer than 3 months)

Turn Around Time Required

☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☐ Other as per contract

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished By: John Tunks	6/28/99	0900	1. Received By:		
2. Relinquished By:			2. Received By:	6/29/99	0900
3. Relinquished By:			3. Received By:		

Comments: All sample bottles contained in 3 seperate coolers

DISTRIBUTION: WHITE - Stays with the Sample; CANARY - Returned to Client with Report; PINK - Field Copy

Sample Receiving Checklist

Lot #: D9F290171 Date/Time Received: 0900 6/29/99

Company Name & Sampling Site: Parsons

*Cooler #(s):

Temperatures: 5 7.8 7.9

Unpacking & Labeling Check Points:

N/A	Yes	No		Initials
	☑	☐	1. Cooler seals intact.	MD
	☑	☐	2. Chain of custody present.	
	☐	☑	3. Bottles broken and/or are leaking, comment if yes.	
			PHOTOGRAPH BROKEN BOTTLES	
	☑	☐	4. Containers labeled, comment if no.	
	☑	☐	5. pH of all samples checked and meet requirements, note exceptions.	
	☑	☐	6. Chain of custody includes "received by" and "relinquished" by signatures, dates, and times.	
	☑	☐	7. Receipt date(s) > 48 hours past the collection date(s)? If yes, notify PA/PM.	
	☐	☑	8. Chain of custody agrees with bottle count, comment if no. See below	
	☑	☐	9. Chain of custody agrees with labels, comment if no.	
☐	☑	☐	10. VOA samples filled completely, comment if no.	
☐	☑	☐	11. VOA bottles preserved, check for labels.	
	☐	☑	12. Did samples require preservation with sodium thiosulfate?	
☐	☐	☑	13. If yes to #12, did the samples contain residual chlorine?	
☐	☐	☑	14. Sediment present in "D," dissolved, bottles.	
	☐	☑	15. Are analyses with short holding times requested?	
☐	☑	☐	16. Is extra sample volume provided for MS, MSD or matrix duplicates?	
	☐	☑	17. Multiphase samples present? If yes, comment below.	
	☐	☑	18. Any subsampling for volatiles? If yes, list samples.	
			PHOTOGRAPH MULTIPHASE SAMPLES	
☑	☐	☐	19. Clear picture taken, labeled, and stapled to project folder.	
☑	☐	☐	20. Subcontract COC signed and sent with samples to bottle prep?	
	☐	☐	21. Was sample labeling double checked by a second person?	

Document any problems or discrepancies and the actions taken to resolve them on a Condition Upon Receipt Anomaly Report (CUR)

Quanterra - Denver
Condition Upon Receipt Anomaly Report (CUR)

Client: Parsons Date/Time: 0900 6/29/99

Lot No: D9F290171 Initiated by: KD

Affected Samples COC#

Client ID	Lab ID	Analyses Requested
All samples have 9x40V (except MW012)		COC indicates only 6 VOAs.
for TB's tests specified are 8260 + Methane.		only 1 TB for 8260 possible.

CONDITION/ANOMALY/VARIANCE (CHECK ALL THAT APPLY):

☐COOLERS
- ☐Not Received, No Chain of Custody (COC)
- ☐Not Received but COC(s) Available
- ☐Leaking
- ☐Other: _____

☐ TEMPERATURE (greater than 6° C)
- ☐Cooler Temp _____
- ☐Temperature Blank _____

☐CONTAINERS
- ☐Leaking
- ☐Broken
- ☐Extra
- ☐Without Labels
- ☐VOA Vials with Headspace _____ mm
- ☐Other: _____

☐CUSTODY SEALS (COOLER(S)/CONTAINER(S)
- ☐None
- ☐ Not Intact
- ☐Other: _____

☐CHAIN OF CUSTODY (COCs)
- ☐Not relinquished by Client; No date/time Relinq.
- ☐ Incomplete Information
- ☐Other: _____

☐ CONTAINER LABELS
- ☐Not the same ID/info as in COC
- ☐ Incomplete

☐ID ☐COLLECTION ☐Time ☐Date ☐PRESERVATIVE
- ☐ Markings/Info smeared or illegible
- ☐Torn
- ☐Other: _____

☐ SAMPLES

☐Samples NOT RECEIVED but listed on COC ——— ☐will be noted on COC Client to send samples with new COC

☐Samples received but NOT LISTED on COC
- ☐Logged based on Label Information
- ☐Logged based on info from other samples on COC
- ☐ Logged according to Work Plan
- ☐Logged on HOLD UNTIL FURTHER NOTICE
- ☐ Other: _____

☐ Mislabeled as to tests, preservatives, etc.
☐Holding time expired
☐ Improper container used
☐Not preserved / Improper preservative used
☐ Improper pH _____ Lab to preserve sample
☐ Insufficient quantities for analysis

Comments: _____

Corrective Action:

☑ Client Informed: verbally on: 6/30/99 By: Jm : In writing on: _____ By: _____

☐ Sample(s) processed "as is". _____

☐ Sample(s) on hold until: _____ If released, notify: _____

Sample Control Supervisor Review: _____ Date: _____

Project Management Review: _____ Date: 6/30/99

SIGNED ORIGINAL MUST BE RETAINED IN THE PROJECT FILE

EXCAVATION SOIL SAMPLE ANALYTICAL RESULTS

Rcd
8/25/99

R & R International

SDG: 6032433

EPA 8260

Data Deliverable

AFCEE
ORGANIC ANALYSES DATA PACKAGE

Analytical Method: EPA 8260 **AAB #:** 67012

Lab Name: PASI, Kansas City **Contract #:** 6032433

Base/Command: **Prime Contractor:** R & R INTERNATI

Field Sample ID	Lab Sample ID
EX1-001	602762668
EX1-002	602762676
EX1-003	602762684
EX1-004	602762692
EX1-005	602762700
EX1-006	602762718
EX1-007	602762726
EX1-008	602762734
EX1-009	602762742
EX1-010	602762759
EX1-011	602762767
EX1-012	602762775
EX1-RINS-01	602762957
EX1-TRIP-01	602762965

Comments:

I certify this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature:

Signature: _____ Name: _____

Date: _____ Title: _____

AFCEE
ANALYSES DATA SHEET 2
RESULTS

Pace Sample No.: 602762668
Client Sample ID: EX1-001
Analytical Method: EPA 8260
Matrix: Soil
Percent Moisture: 20.6

Date Collected: 07/27/99
Date Received: 07/28/99
Date Extracted :
Date Analyzed: 07/29/99

Compound	MDL	PQL	Units	Dilution	Results	Qualifier
Benzene	774	7900	ug/kg	1250	10000	M
Ethylbenzene	4080	7900	ug/kg	1250	160000	M
Toluene	664	7900	ug/kg	1250	170000	M
Xylene (Total)	9800	7900	ug/kg	1250	1000000	
1,2-Dichloroethane-d4 (S)			%	0.79	95.0	
4-Bromofluorobenzene (S)			%	0.79	118	
Dibromofluoromethane (S)			%	0.79	90.0	
Toluene-d8 (S)			%	0.79	107	

Comments:

D = Surrogate diluted below DL
*** = Surr. rec. outside control limits**

AFCEE
ANALYSES DATA SHEET 2
RESULTS

Pace Sample No.: 602762676
Client Sample ID: EX1-002
Analytical Method: EPA 8260
Matrix: Soil
Percent Moisture: 22.1

Date Collected: 07/27/99
Date Received: 07/28/99
Date Extracted :
Date Analyzed: 07/29/99

Compound	MDL	PQL	Units	Dilution	Results	Qualifier
Benzene	0.627	6.4	ug/kg	1.00	12.0	M
Ethylbenzene	3.3	6.4	ug/kg	1.00		M
Toluene	0.538	6.4	ug/kg	1.00		M
Xylene (Total)	7.94	6.4	ug/kg	1.00		U
1,2-Dichloroethane-d4 (S)			%	0.78	96.0	
4-Bromofluorobenzene (S)			%	0.78	114	
Dibromofluoromethane (S)			%	0.78	92.0	
Toluene-d8 (S)			%	0.78	100	

Comments:

D = Surrogate diluted below DL
* = Surr. rec. outside control limits

AFCEE
ANALYSES DATA SHEET 2
RESULTS

Pace Sample No.: 602762684
Client Sample ID: EX1-003
Analytical Method: EPA 8260
Matrix: Soil
Percent Moisture: 21.4

Date Collected: 07/27/99
Date Received: 07/28/99
Date Extracted :
Date Analyzed: 07/28/99

Compound	MDL	PQL	Units	Dilution	Results	Qualifier
Benzene	0.617	6.3	ug/kg	0.99		M
Ethylbenzene	3.25	6.3	ug/kg	0.99		M
Toluene	0.529	6.3	ug/kg	0.99		M
Xylene (Total)	7.81	6.3	ug/kg	0.99		U
1,2-Dichloroethane-d4 (S)			%	0.79	100	
4-Bromofluorobenzene (S)			%	0.79	118	
Dibromofluoromethane (S)			%	0.79	96.0	
Toluene-d8 (S)			%	0.79	100	

Comments:

D = Surrogate diluted below DL
* = Surr. rec. outside control limits

AFCEE
ANALYSES DATA SHEET 2
RESULTS

Pace Sample No.: 602762692
Client Sample ID: EX1-004
Analytical Method: EPA 8260
Matrix: Soil
Percent Moisture: 14.9

Date Collected: 07/27/99
Date Received: 07/28/99
Date Extracted :
Date Analyzed: 07/28/99

Compound	MDL	PQL	Units	Dilution	Results	Qualifier
Benzene	71.5	730	ug/kg	125		M
Ethylbenzene	377	730	ug/kg	125	2600	M
Toluene	61.3	730	ug/kg	125		M
Xylene (Total)	905	730	ug/kg	125	14000	
1.2-Dichloroethane-d4 (S)			%	0.85	104	
4-Bromofluorobenzene (S)			%	0.85	116	
Dibromofluoromethane (S)			%	0.85	94.0	
Toluene-d8 (S)			%	0.85	100	

Comments:

D = Surrogate diluted below DL
* = Surr. rec. outside control limits

AFCEE
ANALYSES DATA SHEET 2
RESULTS

Pace Sample No.: 602762700
Client Sample ID: EX1-005
Analytical Method: EPA 8260
Matrix: Soil
Percent Moisture: 21.5

Date Collected: 07/27/99
Date Received: 07/28/99
Date Extracted :
Date Analyzed: 07/29/99

Compound	MDL	PQL	Units	Dilution	Results	Qualifier
Benzene	0.627	6.4	ug/kg	1.00		M
Ethylbenzene	3.3	6.4	ug/kg	1.00		M
Toluene	0.538	6.4	ug/kg	1.00		M
Xylene (Total)	7.94	6.4	ug/kg	1.00	7.6 J	
1,2-Dichloroethane-d4 (S)			%	0.78	92.0	
4-Bromofluorobenzene (S)			%	0.78	358	*
Dibromofluoromethane (S)			%	0.78	80.0	
Toluene-d8 (S)			%	0.78	128	

Comments:

D = Surrogate diluted below DL
* = Surr. rec. outside control limits

AFCEE
ANALYSES DATA SHEET 2
RESULTS

Pace Sample No.: 602762718
Client Sample ID: EX1-006
Analytical Method: EPA 8260
Matrix: Soil
Percent Moisture: 23

Date Collected: 07/27/99
Date Received: 07/28/99
Date Extracted :
Date Analyzed: 07/28/99

Compound	MDL	PQL	Units	Dilution	Results	Qualifier
Benzene	0.637	6.5	ug/kg	1.00	32.0 J	M
Ethylbenzene	3.35	6.5	ug/kg	1.00	230 J	M
Toluene	0.546	6.5	ug/kg	1.00	13.0 J	M
Xylene (Total)	8.06	6.5	ug/kg	1.00	420 J	
1,2-Dichloroethane-d4 (S)			%	0.77	96.0	
4-Bromofluorobenzene (S)			%	0.77	144	*
Dibromofluoromethane (S)			%	0.77	78.0	
Toluene-d8 (S)			%	0.77	114	

Comments:

D = Surrogate diluted below DL
* = Surr. rec. outside control limits

AFCEE
ANALYSES DATA SHEET 2
RESULTS

Pace Sample No.: 602762726

Client Sample ID: EX1-007

Analytical Method: EPA 8260

Matrix: Soil

Percent Moisture: 26.1

Date Collected: 07/27/99

Date Received: 07/28/99

Date Extracted :

Date Analyzed: 07/28/99

Compound	MDL	PQL	Units	Dilution	Results	Qualifier
Benzene	2.84	29.0	ug/kg	4.24	7500	M
Ethylbenzene	15.0	29.0	ug/kg	4.24	12000	M
Toluene	2.44	29.0	ug/kg	4.24	730	M
Xylene (Total)	36.0	29.0	ug/kg	4.24	16000	
1,2-Dichloroethane-d4 (S)			%	0.74	89.0	
4-Bromofluorobenzene (S)			%	0.74	122	
Dibromofluoromethane (S)			%	0.74	88.0	
Toluene-d8 (S)			%	0.74	111	

Comments:

D = Surrogate diluted below DL

*** = Surr. rec. outside control limits**

AFCEE
ANALYSES DATA SHEET 2
RESULTS

Pace Sample No.: 602762734
Client Sample ID: EX1-008
Analytical Method: EPA 8260
Matrix: Soil
Percent Moisture: 29.9

Date Collected: 07/27/99
Date Received: 07/28/99
Date Extracted :
Date Analyzed: 07/28/99

Compound	MDL	PQL	Units	Dilution	Results	Qualifier
Benzene	0.666	6.8	ug/kg	0.95		M
Ethylbenzene	3.51	6.8	ug/kg	0.95		M
Toluene	0.571	6.8	ug/kg	0.95		M
Xylene (Total)	8.43	6.8	ug/kg	0.95		U
1,2-Dichloroethane-d4 (S)			%	0.70	98.0	
4-Bromofluorobenzene (S)			%	0.70	120	
Dibromofluoromethane (S)			%	0.70	96.0	
Toluene-d8 (S)			%	0.70	108	

Comments:

D = Surrogate diluted below DL
* = Surr. rec. outside control limits

AFCEE
ANALYSES DATA SHEET 2
RESULTS

Pace Sample No.: 602762742

Client Sample ID: EX1-009 **Date Collected:** 07/27/99

Analytical Method: EPA 8260 **Date Received:** 07/28/99

Matrix: Soil **Date Extracted :**

Percent Moisture: 27.7 **Date Analyzed:** 07/29/99

Compound	MDL	PQL	Units	Dilution	Results	Qualifier
Benzene	0.676	6.9	ug/kg	1.00		M
Ethylbenzene	3.56	6.9	ug/kg	1.00		M
Toluene	0.580	6.9	ug/kg	1.00		M
Xylene (Total)	8.56	6.9	ug/kg	1.00		U
1,2-Dichloroethane-d4 (S)			%	0.72	96.0	
4-Bromofluorobenzene (S)			%	0.72	112	
Dibromofluoromethane (S)			%	0.72	90.0	
Toluene-d8 (S)			%	0.72	120	

Comments:

D = Surrogate diluted below DL

*** = Surr. rec. outside control limits**

AFCEE
ANALYSES DATA SHEET 2
RESULTS

Pace Sample No.: 602762759
Client Sample ID: EX1-010
Analytical Method: EPA 8260
Matrix: Soil
Percent Moisture: 26.5

Date Collected: 07/27/99
Date Received: 07/28/99
Date Extracted :
Date Analyzed: 07/29/99

Compound	MDL	PQL	Units	Dilution	Results	Qualifier
Benzene	0.666	6.8	ug/kg	1.00		M
Ethylbenzene	3.51	6.8	ug/kg	1.00		M
Toluene	0.571	6.8	ug/kg	1.00		M
Xylene (Total)	8.43	6.8	ug/kg	1.00		U
1,2-Dichloroethane-d4 (S)			%	0.74	96.0	
4-Bromofluorobenzene (S)			%	0.74	136	*
Dibromofluoromethane (S)			%	0.74	95.0	
Toluene-d8 (S)			%	0.74	97.0	

Comments:

D = Surrogate diluted below DL
* = Surr. rec. outside control limits

AFCEE
ANALYSES DATA SHEET 2
RESULTS

Pace Sample No.: 602762767
Client Sample ID: EX1-011
Analytical Method: EPA 8260
Matrix: Soil
Percent Moisture: 26.1

Date Collected: 07/27/99
Date Received: 07/28/99
Date Extracted :
Date Analyzed: 07/29/99

Compound	MDL	PQL	Units	Dilution	Results	Qualifier
Benzene	3.33	34.0	ug/kg	5.00	440	M
Ethylbenzene	17.5	34.0	ug/kg	5.00	120	M
Toluene	2.86	34.0	ug/kg	5.00	19.0	M
Xylene (Total)	42.2	34.0	ug/kg	5.00	110	
1,2-Dichloroethane-d4 (S)			%	0.74	98.0	
4-Bromofluorobenzene (S)			%	0.74	101	
Dibromofluoromethane (S)			%	0.74	95.0	
Toluene-d8 (S)			%	0.74	107	

Comments:

D = Surrogate diluted below DL
* = Surr. rec. outside control limits

AFCEE
ANALYSES DATA SHEET 2
RESULTS

Pace Sample No.: 602762775
Client Sample ID: EX1-012
Analytical Method: EPA 8260
Matrix: Soil
Percent Moisture: 18.8

Date Collected: 07/27/99
Date Received: 07/28/99
Date Extracted :
Date Analyzed: 07/29/99

Compound	MDL	PQL	Units	Dilution	Results	Qualifier
Benzene	0.608	6.2	ug/kg	1.00		M
Ethylbenzene	3.2	6.2	ug/kg	1.00		M
Toluene	0.521	6.2	ug/kg	1.00		M
Xylene (Total)	7.69	6.2	ug/kg	1.00		U
1,2-Dichloroethane-d4 (S)			%	0.81	102	
4-Bromofluorobenzene (S)			%	0.81	106	
Dibromofluoromethane (S)			%	0.81	94.0	
Toluene-d8 (S)			%	0.81	94.0	

Comments:

D = Surrogate diluted below DL
* = Surr. rec. outside control limits

AFCEE
ANALYSES DATA SHEET 2
RESULTS

Pace Sample No.: 602762957

Client Sample ID: EX1-RINS-01

Analytical Method: EPA 8260

Matrix: Water

Percent Moisture:

Date Collected: 07/27/99

Date Received: 07/28/99

Date Extracted :

Date Analyzed: 07/29/99

Compound	MDL	PQL	Units	Dilution	Results	Qualifier
Benzene	0.875	5.00	ug/l	1.00		U
Ethylbenzene	1.17	5.00	ug/l	1.00		U
Toluene	0.455	5.00	ug/l	1.00		U
Xylene (Total)	0.330	5.00	ug/l	1.00		U
4-Bromofluorobenzene (S)			%	1.00	98.0	
Dibromofluoromethane (S)			%	1.00	99.0	
Toluene-d8 (S)			%	1.00	97.0	

Comments:

D = Surrogate diluted below DL

*** = Surr. rec. outside control limits**

AFCEE
ANALYSES DATA SHEET 2
RESULTS

Pace Sample No.: 602762965
Client Sample ID: EX1-TRIP-01
Analytical Method: EPA 8260
Matrix: Water
Percent Moisture:

Date Collected: 07/27/99
Date Received: 07/28/99
Date Extracted :
Date Analyzed: 07/29/99

Compound	MDL	PQL	Units	Dilution	Results	Qualifier
Benzene	0.875	5.00	ug/l	1.00		U
Ethylbenzene	1.17	5.00	ug/l	1.00		U
Toluene	0.455	5.00	ug/l	1.00		U
Xylene (Total)	0.330	5.00	ug/l	1.00		U
4-Bromofluorobenzene (S)			%	1.00	99.0	
Dibromofluoromethane (S)			%	1.00	100	
Toluene-d8 (S)			%	1.00	98.0	

Comments:

D = Surrogate diluted below DL
*** = Surr. rec. outside control limits**

Project Narrative

PACE Project No. *6032433*

This report details any difficulties encountered during the preparation and analysis of samples for this project. The issues addressed will include: out-of-control QC sample parameters, instrument calibration complications, method blank contaminations, unusual sample preparation notations, dilutions required as a result of sample matrix interference or limited sample volume, and any additional information that is necessary to explain discrepancies between the data presented and the QC objectives in the QAPP.

Please note that this report only contains information regarding problems encountered with the analyses. If a particular QC element is not addressed, all specifications presented in the QAPP were satisfied for that issue.

GC/MS VOC's in Soil

QCSample No. (if applicable)

Date Occured 7/29/99 6613

Internal Standard Area outside specification (GC/MS)

The area of the internal standard was less than 50% of the associated continuing calibration. The sample was analyzed twice, confirming the non-conformance as a matrix related problem.

Affected Samples	Affected Analytes
602762759	Chlorobenzene-d5

QCSample No. (if applicable) **602766644**

1

Date Occured 7/28/99 6611

MS or MSD outlier

MS and MSD recoveries were outside control limits for the listed analytes. The successful recovery in the LCS and the high concentration of analytes in the OQS suggest a matrx effect.

Affected Samples	Affected Analytes
602762668	Benzene
602762676	Ethylbenzene
602762684	M&P-Xylene
602762692	O-Xylene (1,2-Dimethylbenzene)
602762700	toluene
602762718	
602762726	
602762734	
602762742	
602762759	
602762767	
602762775	

QCSample No. (if applicable) **602766651**

Date Occured 7/28/99 6610

MSD RPD outlier

The MSD RPD was above the control limit for the associated analytes. Successful recovery in the LCS and the high concentration of analytes in the OQS suggest a matrix effect.

Affected Samples	Affected Analytes
602762668	Benzene
602762676	Ethylbenzene
602762684	M&P-Xylene
602762692	O-Xylene (1,2-Dimethylbenzene)
602762700	toluene
602762718	
602762726	
602762734	
602762742	
602762759	
602762767	
602762775	

QCSample No. (if applicable)

Date Occured 7/28/99 6612

Surrogate recovery outlier above the upper control limit

Surrogate recovery exceeded control limits for the listed samples. No further action was taken.

Affected Samples	Affected Analytes
602762700	4-Bromofluorobenzene (S)
602762718	
602762759	

The Right Co[illegible]try, The Right Solution"

The Chain of Custody is a LEGAL DOCUMENT. All relevant fields must be completed acc[illegible].

Chain of Custody / Analytical Request Document

443903 60[illegible]

Page: 1 of 2

To Be Completed by Pace Analytical and Client

Required Client Information: **Section A**

Company: R&R International, Inc.
Address: 1234 Cleveland Massillon Rd
AKRON, OH 44321
Phone: 330-666-2200 Fax: 330-666-7874

Required Client Information: **Section B**

Report To: Rick Callahan
Invoice To: Rick Callahan
P.O.: —
Project Name: Parsons
Project Number: AR27.05

Client Information (Check quote/contract):
Requested Due Date: 29 JUL 99 NOON
TAT: 24 HRS
* Under 14 day turnaround subject to laboratory and contractual obligations and may result in a Rush Turnaround Surcharge
Turn Around Time (TAT) in calender days

Section C

Quote Reference:
Project Manager:
Project #:
Profile #:
Requested Analysis

Section D Required Client Information:

SAMPLE ID

One character per box.
(A-Z, 0-9 / -)
Sample IDs MUST BE UNIQUE

Valid Matrix Codes ◄

MATRIX	CODE
WATER	WT
SOIL	SL
OIL	OL
WIPE	WP
AIR	AR
TISSUE	TS
OTHER	OT

ITEM #	SAMPLE ID	MATRIX CODE	DATE COLLECTED (dd / mm / yy)	TIME COLLECTED (military)	# Containers	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	BTEX	GRO	DRO	8015M 8015M	Remarks / Lab ID
1	EX1-001	SL	27/07/99	0800	3	X						X	X	X		602762668
2	EX1-002	SL		0815	3	X						X	X	X		602762676
3	EX1-003	SL		0825	3	X						X	X	X		602762684
4	EX1-004	SL		0940	3	X						X	X	X		602762692
5	EX1-005	SL		0950	3	X						X	X	X		602762700
6	EX1-006	SL		1005	3	X						X	X	X		602762718
7	EX1-007	SL		1020	6	X						X	X	X		602762726 PRIMARY AND MS/MSD SAMPLE.
8	EX1-008	SL		1035	3	X						X	X	X		602762734
9	EX1-009	SL		1040	3	X						X	X	X		602762742
10	EX1-010	SL		1050	3	X						X	X	X		602762759
11	EX1-011	SL		1105	3	X						X	X	X		602762767
12	EX1-012	SL	27/07/99	1130	3	X						X	X	X		602762775

Sample Condition		Sample Notes	Item No.	Relinquished By / Company	Date	Time	Accepted By / Company	Date	Time
Temp in °C:							[signature]	7/28/99	0900
Received on ICE:	Y / N								
Sealed Cooler:	Y / N								
Samples Intact:	Y / N								

Additional Comments:

DRO -- DIESEL RANGE ORGANICS
GRO - GASOLINE RANGE ORGANICS

PACE PROJECT MANAGER: ANDREA

ORIGINAL.

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: TED HARTFELDER (PARSONS ES)
SIGNATURE of SAMPLER: [signature]
DATE Signed (MM / DD / YY): 07/27/99

SEE REVERSE SIDE FOR INSTRUCTIONS

Pace Analytical Services, Inc. Form COC01 XLS 08/98

FEDERAL EXPRESS AIRBILL No. 808536130?0

The Right Chemistry, The Right Solution®

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

443904 6032433

Page: 2 of 2

Required Client Information: Section A

Company: RER International, Inc.
Address: 1374 Cleveland-Massillon Rd. Akron, OH 44321
Phone: 330-666-2200 Fax: 330-666-7874

Required Client Information: Section B

Report To: Rick Callahan
Invoice To: Rick Callahan
PO: —
Project Name: Parsons
Project Number: AR27.05

Client Information (Check quote/contract):
Requested Due Date: 21 JUL 99 NOON *TAT: 24 HOUR
* Under 14 day turnaround subject to laboratory and contractual obligations and may result in a Rush Turnaround Surcharge
Turn Around Time (TAT) in calender days.

To Be Completed by Pace Analytical and Client: Section C

Quote Reference:
Project Manager:
Project #:
Profile #:
Requested Analysis:

Section D Required Client Information:

SAMPLE ID

One character per box.
(A-Z, 0-9 / .-)
Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
WATER	WT
SOIL	SL
OIL	OL
WIPE	WP
AIR	AR
TISSUE	TS
OTHER	OT

ITEM #	SAMPLE ID	MATRIX CODE	DATE COLLECTED (dd / mm / yy)	TIME COLLECTED (mm:hh a/m)	# Containers	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Remarks / Lab ID
1	EX1-RINS-01	WT	27/07/99	0840	5	X			X			X X X (BTEX GRO DRO) 602762957
2	EX1-TRIP-01	WT	27/07/99	0730	2	X						X LABORATORY PREPARED TRIP BLANK 602762965
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												

Sample Condition		Sample Notes	Item No.	Relinquished By / Company	Date	Time	Accepted By / Company	Date	Time
Temp in °C:							Connie Shore	7/28/99	0900
Received on ICE:	Y / N								
Sealed Cooler:	Y / N								
Samples Intact:	Y / N								

Additional Comments: GRO - GASOLINE RANGE ORGANICS
DRO - DIESEL RANGE ORGANICS

PA[redacted] PROJECT MANAGER: ANDREA

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: TED HARTEELWER (PARSONS ES)
SIGNATURE of SAMPLER: Ted Hartelwer
DATE Signed (MM / DD / YY): 07/[redacted]/99

SEE REVERSE SIDE FOR INSTRUCTIONS

Pace Analytical Services

COC01 XLS 08/98

[redacted] Project No. 80956361200

R & R INTERNATIONAL

SDG 6032433

Data Deliverable

EPA 8015 Modified

AFCEE
ORGANIC ANALYSES DATA PACKAGE

Analytical Method: EPA 8015 Modified **AAB #:** 66992

Lab Name: PASI, Kansas City **Contract #:** ~~6032433~~ F41624-94-D-8047

Base/Command: **Prime Contractor:** R & R INTERNATI

Field Sample ID	Lab Sample ID
EX1-001	602762668
EX1-002	602762676
EX1-003	602762684
EX1-004	602762692
EX1-005	602762700
EX1-006	602762718
EX1-007	602762726
EX1-008	602762734
EX1-009	602762742
EX1-010	602762759
EX1-011	602762767
EX1-012	602762775
EX1-RINS-01	602762957

Comments:

I certify this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature:

Signature: _____ Name: _____

Date: _____ Title: _____

AFCEE
ANALYSES DATA SHEET 2
RESULTS

Pace Sample No.: 602762668
Client Sample ID: EX1-001
Analytical Method: EPA 8015 Modified
Matrix: Soil
Percent Moisture: 20.6

Date Collected: 07/27/99
Date Received: 07/28/99
Date Extracted :
Date Analyzed: 07/30/99

Compound	MDL	PQL	Units	Dilution	Results	Qualifier
Gasoline Range Hydrocarbons	24.0	48.0	mg/kg	38.5	4000	B
4-Bromofluorobenzene (S)			%	0.79	109	

Comments:

D = Surrogate diluted below DL
*** = Surr. rec. outside control limits**

AFCEE
ANALYSES DATA SHEET 2
RESULTS

Pace Sample No.: 602762676
Client Sample ID: EX1-002
Analytical Method: EPA 8015 Modified
Matrix: Soil
Percent Moisture: 22.1

Date Collected: 07/27/99
Date Received: 07/28/99
Date Extracted :
Date Analyzed: 07/29/99

Compound	MDL	PQL	Units	Dilution	Results	Qualifier
Gasoline Range Hydrocarbons	0.650	1.3	mg/kg	1.00	3.7 U	B
4-Bromofluorobenzene (S)			%	0.78	78.0	

Comments:

D = Surrogate diluted below DL
* = Surr. rec. outside control limits

AFCEE
ANALYSES DATA SHEET 2
RESULTS

Pace Sample No.: 602762684
Client Sample ID: EX1-003
Analytical Method: EPA 8015 Modified
Matrix: Soil
Percent Moisture: 21.4

Date Collected: 07/27/99
Date Received: 07/28/99
Date Extracted :
Date Analyzed: 07/29/99

Compound	MDL	PQL	Units	Dilution	Results		Qualifier
Gasoline Range Hydrocarbons	0.650	1.3	mg/kg	0.99	2.9	U	B
4-Bromofluorobenzene (S)			%	0.79	85.0		

Comments:

D = Surrogate diluted below DL
*** = Surr. rec. outside control limits**

AFCEE
ANALYSES DATA SHEET 2
RESULTS

Pace Sample No.: 602762692
Client Sample ID: EX1-004
Analytical Method: EPA 8015 Modified
Matrix: Soil
Percent Moisture: 14.9

Date Collected: 07/27/99
Date Received: 07/28/99
Date Extracted :
Date Analyzed: 07/29/99

Compound	MDL	PQL	Units	Dilution	Results	Qualifier
Gasoline Range Hydrocarbons	0.600	1.2	mg/kg	1.00	170	B
4-Bromofluorobenzene (S)			%	0.85	92.0	

Comments:

D = Surrogate diluted below DL
*** = Surr. rec. outside control limits**

AFCEE
ANALYSES DATA SHEET 2
RESULTS

Pace Sample No.: 602762700
Client Sample ID: EX1-005
Analytical Method: EPA 8015 Modified
Matrix: Soil
Percent Moisture: 21.5

Date Collected: 07/27/99
Date Received: 07/28/99
Date Extracted :
Date Analyzed: 07/29/99

Compound	MDL	PQL	Units	Dilution	Results	Qualifier
Gasoline Range Hydrocarbons	0.650	1.3	mg/kg	0.99	42.0	B
4-Bromofluorobenzene (S)			%	0.78	95.0	

Comments:

D = Surrogate diluted below DL
*** = Surr. rec. outside control limits**

AFCEE
ANALYSES DATA SHEET 2
RESULTS

Pace Sample No.: 602762718
Client Sample ID: EX1-006
Analytical Method: EPA 8015 Modified
Matrix: Soil
Percent Moisture: 23

Date Collected: 07/27/99
Date Received: 07/28/99
Date Extracted :
Date Analyzed: 07/29/99

Compound	MDL	PQL	Units	Dilution	Results	Qualifier
Gasoline Range Hydrocarbons	2.6	5.2	mg/kg	4.00	250	B
4-Bromofluorobenzene (S)			%	0.77	96.0	

Comments:

D = Surrogate diluted below DL
* = Surr. rec. outside control limits

AFCEE
ANALYSES DATA SHEET 2
RESULTS

Pace Sample No.: 602762726

Client Sample ID: EX1-007

Analytical Method: EPA 8015 Modified

Matrix: Soil

Percent Moisture: 26.1

Date Collected: 07/27/99

Date Received: 07/28/99

Date Extracted :

Date Analyzed: 07/29/99

Compound	MDL	PQL	Units	Dilution	Results	Qualifier
Gasoline Range Hydrocarbons	0.650	1.3	mg/kg	1.00	12.0	B
4-Bromofluorobenzene (S)			%	0.74	89.0	

Comments:

D = Surrogate diluted below DL

*** = Surr. rec. outside control limits**

AFCEE
ANALYSES DATA SHEET 2
RESULTS

Pace Sample No.: 602762734
Client Sample ID: EX1-008
Analytical Method: EPA 8015 Modified
Matrix: Soil
Percent Moisture: 29.9

Date Collected: 07/27/99
Date Received: 07/28/99
Date Extracted :
Date Analyzed: 07/29/99

Compound	MDL	PQL	Units	Dilution	Results		Qualifier
Gasoline Range Hydrocarbons	0.700	1.4	mg/kg	0.98	2.1	U	B
4-Bromofluorobenzene (S)			%	0.70	88.0		

Comments:

D = Surrogate diluted below DL
*** = Surr. rec. outside control limits**

AFCEE
ANALYSES DATA SHEET 2
RESULTS

Pace Sample No.: 602762742

Client Sample ID: EX1-009 **Date Collected:** 07/27/99

Analytical Method: EPA 8015 Modified **Date Received:** 07/28/99

Matrix: Soil **Date Extracted :**

Percent Moisture: 27.7 **Date Analyzed:** 07/29/99

Compound	MDL	PQL	Units	Dilution	Results		Qualifier
Gasoline Range Hydrocarbons	0.700	1.4	mg/kg	0.99	2.00	U	B
4-Bromofluorobenzene (S)			%	0.72	91.0		

Comments:

D = Surrogate diluted below DL

*** = Surr. rec. outside control limits**

AFCEE
ANALYSES DATA SHEET 2
RESULTS

Pace Sample No.: 602762759
Client Sample ID: EX1-010
Analytical Method: EPA 8015 Modified
Matrix: Soil
Percent Moisture: 26.5

Date Collected: 07/27/99
Date Received: 07/28/99
Date Extracted :
Date Analyzed: 07/29/99

Compound	MDL	PQL	Units	Dilution	Results		Qualifier
Gasoline Range Hydrocarbons	0.650	1.3	mg/kg	0.99	2.1	U	B
4-Bromofluorobenzene (S)			%	0.74	89.0		

Comments:

D = Surrogate diluted below DL
* = Surr. rec. outside control limits

AFCEE
ANALYSES DATA SHEET 2
RESULTS

Pace Sample No.: 602762767
Client Sample ID: EX1-011
Analytical Method: EPA 8015 Modified
Matrix: Soil
Percent Moisture: 26.1

Date Collected: 07/27/99
Date Received: 07/28/99
Date Extracted :
Date Analyzed: 07/29/99

Compound	MDL	PQL	Units	Dilution	Results	Qualifier
Gasoline Range Hydrocarbons	0.650	1.3	mg/kg	1.00	6.00	B
4-Bromofluorobenzene (S)			%	0.74	94.0	

Comments:

D = Surrogate diluted below DL
*** = Surr. rec. outside control limits**

AFCEE
ANALYSES DATA SHEET 2
RESULTS

Pace Sample No.: 602762775
Client Sample ID: EX1-012
Analytical Method: EPA 8015 Modified
Matrix: Soil
Percent Moisture: 18.8

Date Collected: 07/27/99
Date Received: 07/28/99
Date Extracted :
Date Analyzed: 07/29/99

Compound	MDL	PQL	Units	Dilution	Results	Qualifier
Gasoline Range Hydrocarbons	0.600	1.2	mg/kg	1.00	2.00 U	B
4-Bromofluorobenzene (S)			%	0.81	83.0	

Comments:

D = Surrogate diluted below DL
* = Surr. rec. outside control limits

AFCEE
ANALYSES DATA SHEET 2
RESULTS

Pace Sample No.: 602762957
Client Sample ID: EX1-RINS-01
Analytical Method: EPA 8015 Modified
Matrix: Water
Percent Moisture:

Date Collected: 07/27/99
Date Received: 07/28/99
Date Extracted :
Date Analyzed: 07/28/99

Compound	MDL	PQL	Units	Dilution	Results	Qualifier
Gasoline Range Hydrocarbons	0.0140	0.100	mg/l	1.00		U
4-Bromofluorobenzene (S)			%	1.00	101	

Comments:

D = Surrogate diluted below DL
*** = Surr. rec. outside control limits**

Project Narrative

PACE Project No. *6032433*

This report details any difficulties encountered during the preparation and analysis of samples for this project. The issues addressed will include: out-of-control QC sample parameters, instrument calibration complications, method blank contaminations, unusual sample preparation notations, dilutions required as a result of sample matrix interference or limited sample volume, and any additional information that is necessary to explain discrepancies between the data presented and the QC objectives in the QAPP.

Please note that this report only contains information regarding problems encountered with the analyses. If a particular QC element is not addressed, all specifications presented in the QAPP were satisfied for that issue.

TPH Gas

QCSample No. (if applicable)

Date Occured 6627

Miscellaneous (Explain in detail)

The OQS designated for the analysis of a Matrix Spike sample and a Matrix Spike Duplicate sample is not client specific to the data deliverable SDG 6032433.

Affected Samples	Affected Analytes
602762957	

1

Date Occured 6626

Miscellaneous (Explain in detail)

The surrogate retention time for method EPA 8015 Modified is slightly outside the 0.07 minute guideline referenced to the initial calibration of May 24, 1999, instrument KS111.

Affected Samples	Affected Analytes
602762668	
602762676	
602762684	
602762692	
602762700	
602762718	
602762726	
602762734	
602762742	
602762759	
602762767	
602762775	

Date Occured 6624

Miscellaneous (Explain in detail)

Pace Analytical Services and R & R International have a mutual agreement of a 5.0 mg/kg PRL for the soil samples of SDG 6032433. Due to the rush analysis requested by the client for method EPA 8015 Modified, the current a-code containing a PRL of 1.0 mg/kg was used to check in the soil samples of SDG 6032433. As a result, the AFCEE FORM O-2 indicates blank contamination due to the associated method blank contains gasoline at 1.1 mg/kg. Please disregard the "B" flag on the AFCEE FORM O-2 and note the actual PRL for the soil samples of SDG 6032433 is 5.0 mg/kg.

Affected Samples	Affected Analytes
602762668	Gasoline Range Hydrocarbons
602762676	
602762684	
602762692	
602762700	
602762718	
602762726	
602762734	
602762742	
602762759	
602762767	
602762775	

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The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

443903 6032433

Page: 1 of 2

To Be Completed by Pace Analytical and Client

Section A — Required Client Information:

Company: P&R International, Inc.
Address: 1234 Cleveland Massillon Rd
AKRON, OH 44321
Phone: 330-666-2200 Fax: 330-666-7874

Section B — Required Client Information:

Report To: Rick Callahan
Invoice To: Rick Callahan
P.O.: —
Project Name: PARSONS
Project Number: AR27.05

Client Information (Check quote/contract):
Requested Due Date: 29 JUL 99 NOON | TAT: 24 HRS

* Under 14 day turnaround subject to laboratory and contractual obligations and may result in a Rush Turnaround Surcharge

Turn Around Time (TAT) in calender days

Section C

Quote Reference:
Project Manager:
Project #:
Profile #:
Requested Analysis

Section D — Required Client Information:

SAMPLE ID

One character per box.
(A-Z, 0-9 / , -)
Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
WATER	WT
SOIL	SL
OIL	OL
WIPE	WP
AIR	AR
TISSUE	TS
OTHER	OT

ITEM #	SAMPLE ID	MATRIX CODE	DATE COLLECTED (dd / mm / yy)	TIME COLLECTED (military time)	# Containers	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	BTEX	GRO	DRO	8015 8021	Remarks / Lab ID
1	EX1-001	SL	27/07/99	0800	3	X						X	X	X		602762668
2	EX1-002	SL		0815	3	X						X	X	X		602762676
3	EX1-003	SL		0825	3	X						X	X	X		602762684
4	EX1-004	SL		0910	3	X						X	X	X		602762692
5	EX1-005	SL		0950	3	X						X	X	X		602762700
6	EX1-006	SL		1005	3	X						X	X	X		602762718
7	EX1-007	SL		1020	6	X						X	X	X	PRIMARY AND MS/MSD SAMPLE.	602762726
8	EX1-008	SL		1035	3	X						X	X	X		602762734
9	EX1-009	SL		1040	3	X						X	X	X		602762742
10	EX1-010	SL		1050	3	X						X	X	X		602762759
11	EX1-011	SL		1105	3	X						X	X	X		602762767
12	EX1-012	SL	27/07/99	1130	3	X						X	X	X		602762767

Sample Condition		Sample Notes	Item No.	Relinquished By / Company	Date	Time	Accepted By / Company	Date	Time
Temp in °C:									
Received on ICE:	Y / N							7/28/99	0900
Sealed Cooler:	Y / N								
Samples Intact:	Y / N								

Additional Comments:

DRO - DIESEL RANGE ORGANICS
GRO - GASOLINE RANGE ORGANICS
PROJECT MANAGER: ANDREA

SEE REVERSE FOR INSTRUCTIONS

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: TED HARTFELDER (PARSONS ES)
SIGNATURE of SAMPLER: Ted Hartfelder
DATE Signed (MM / DD / YY): 07/27/99

ORIGINAL

Pace Analytical

The Right ... istry, The Right Solution®

CHAIN OF-CUSTODY / Analytical Request Document

The C... stody is a LEGAL DOCUMENT. All relevant fields must be completed accur

443904 2433

Page: 2 of 2

To Be Completed by Pace Analytical and Client — Section C

Section A — Required Client Information:	Section B — Required Client Information:	Client Information (Check quote/contract):
Company: R&R International, Inc.	Report To: Rick Callahan	Requested Due Date: 27JUL99 NOON
Address: 1231 Cleveland-Massillon Rd. Akron, OH 44321	Invoice To: Rick Callahan	TAT: 24 HOUR
Phone: 330-666-2200 Fax: 330-666-7874	PO: —	* Under 14 day turnaround subject to laboratory and contractual obligations and may result in a Rush Turnaround Surcharge.
	Project Name: Parsons	Turn Around Time (TAT) in calender days.
	Project Number: AR27.05	

Quote Reference:

Project Manager:

Project #:

Profile #:

Requested Analysis:

Section D — Required Client Information:

SAMPLE ID

One character per box.
(A–Z, 0–9 / -)
Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
WATER	WT
SOIL	SL
OIL	OL
WIPE	WP
AIR	AR
TISSUE	TS
OTHER	OT

ITEM #	SAMPLE ID	MATRIX CODE	DATE COLLECTED (dd / mm / yy)	TIME COLLECTED (hrs mm:hh a/m)	# Containers	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	BTEX	GRO	DRO	Remarks / Lab ID
1	EX1-RINS-01	WT	27/07/99	0840	5	X			X			X	X	X	602762957
2	EX1-TRIP-01	WT	27/07/99	0730	2	X						X	LABORATORY PREPARED TRIP BLANK		602762965
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															

Sample Condition		Sample Notes	Item No.	Relinquished By / Company	Date	Time	Accepted By / Company	Date	Time
Temp in °C:							Connie Andrea	7/28/99	09
Received on ICE:	Y / N								
Sealed Cooler:	Y / N								
Samples Intact:	Y / N								

Additional Comments: CRO - GASOLINE RANGE ORGANICS
DRO - DIESEL RANGE ORGANICS

PACE PROJECT MANAGER: ANDREA

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: TED HARTEELIVER (PARSONS ES)

SIGNATURE of SAMPLER: Ted Harteeliver

DATE Signed: (MM / DD / YY) 07/27/99

SEE REVERSE SIDE FOR INSTRUCTIONS

R & R INTERNATIONAL

SDG 6032433

Data Deliverable

EPA 8015 Modified Ext

AFCEE
ORGANIC ANALYSES DATA PACKAGE

Analytical Method: EPA 8015 Mod Ext **AAB #:** 66958 /466968

Lab Name: PASI, Kansas City **Contract #:** ~~6032433~~ F41624-04-D-8044

Base/Command: **Prime Contractor:** R & R INTERNATI

Field Sample ID	Lab Sample ID
EX1-001	602762668
EX1-002	602762676
EX1-003	602762684
EX1-004	602762692
EX1-005	602762700
EX1-006	602762718
EX1-007	602762726
EX1-008	602762734
EX1-009	602762742
EX1-010	602762759
EX1-011	602762767
EX1-012	602762775
EX1-RINS-01	602762957

Comments:

I certify this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature:

Signature: _____ Name: _____

Date: _____ Title: _____

AFCEE
ANALYSES DATA SHEET 2
RESULTS

Pace Sample No.: 602762668

Client Sample ID: EX1-001

Analytical Method: EPA 8015 Mod Ext

Matrix: Soil

Percent Moisture: 20.6

Date Collected: 07/27/99

Date Received: 07/28/99

Date Extracted : 07/28/99

Date Analyzed: 07/31/99

Compound	MDL	PQL	Units	Dilution	Results	Qualifier
Diesel Fuel		12.0	mg/kg	0.93		U
Jet Fuel		12.0	mg/kg	0.93		U
n-Tetracosane (S)			%	0.79	78.0	
p-Terphenyl (S)			%	0.79	65.0	

Comments:

D = Surrogate diluted below DL

* = Surr. rec. outside control limits

AFCEE
ANALYSES DATA SHEET 2
RESULTS

Pace Sample No.: 602762676
Client Sample ID: EX1-002
Analytical Method: EPA 8015 Mod Ext
Matrix: Soil
Percent Moisture: 22.1

Date Collected: 07/27/99
Date Received: 07/28/99
Date Extracted : 07/28/99
Date Analyzed: 07/31/99

Compound	MDL	PQL	Units	Dilution	Results	Qualifier
Diesel Fuel		12.0	mg/kg	0.95		U
Jet Fuel		12.0	mg/kg	0.95		U
n-Tetracosane (S)			%	0.78	84.0	
p-Terphenyl (S)			%	0.78	58.0	

Comments:

D = Surrogate diluted below DL
*** = Surr. rec. outside control limits**

AFCEE
ANALYSES DATA SHEET 2
RESULTS

Pace Sample No.: 602762684
Client Sample ID: EX1-003
Analytical Method: EPA 8015 Mod Ext
Matrix: Soil
Percent Moisture: 21.4

Date Collected: 07/27/99
Date Received: 07/28/99
Date Extracted : 07/28/99
Date Analyzed: 07/31/99

Compound	MDL	PQL	Units	Dilution	Results	Qualifier
Diesel Fuel		12.0	mg/kg	0.98		U
Jet Fuel		12.0	mg/kg	0.98		U
n-Tetracosane (S)			%	0.79	80.0	
p-Terphenyl (S)			%	0.79	61.0	

Comments:

D = Surrogate diluted below DL
* = Surr. rec. outside control limits

AFCEE
ANALYSES DATA SHEET 2
RESULTS

Pace Sample No.: 602762692
Client Sample ID: EX1-004
Analytical Method: EPA 8015 Mod Ext
Matrix: Soil
Percent Moisture: 14.9

Date Collected: 07/27/99
Date Received: 07/28/99
Date Extracted : 07/28/99
Date Analyzed: 07/31/99

Compound	MDL	PQL	Units	Dilution	Results	Qualifier
Diesel Fuel		11.0	mg/kg	0.95	190	
Jet Fuel		11.0	mg/kg	0.95		U
n-Tetracosane (S)			%	0.85	82.0	
p-Terphenyl (S)			%	0.85	68.0	

Comments:

D = Surrogate diluted below DL
* = Surr. rec. outside control limits

AFCEE
ANALYSES DATA SHEET 2
RESULTS

Pace Sample No.: 602762700
Client Sample ID: EX1-005
Analytical Method: EPA 8015 Mod Ext
Matrix: Soil
Percent Moisture: 21.5

Date Collected: 07/27/99
Date Received: 07/28/99
Date Extracted : 07/28/99
Date Analyzed: 07/31/99

Compound	MDL	PQL	Units	Dilution	Results	Qualifier
Diesel Fuel		12.0	mg/kg	0.98		U
Jet Fuel		12.0	mg/kg	0.98	160	
n-Tetracosane (S)			%	0.78	86.0	
p-Terphenyl (S)			%	0.78	60.0	

Comments:

D = Surrogate diluted below DL
*** = Surr. rec. outside control limits**

AFCEE
ANALYSES DATA SHEET 2
RESULTS

Pace Sample No.: 602762718
Client Sample ID: EX1-006
Analytical Method: EPA 8015 Mod Ext
Matrix: Soil
Percent Moisture: 23

Date Collected: 07/27/99
Date Received: 07/28/99
Date Extracted : 07/28/99
Date Analyzed: 07/31/99

Compound	MDL	PQL	Units	Dilution	Results	Qualifier
Diesel Fuel		13.0	mg/kg	0.99		U
Jet Fuel		13.0	mg/kg	0.99	400	
n-Tetracosane (S)			%	0.77	77.0	
p-Terphenyl (S)			%	0.77	53.0	

Comments:

D = Surrogate diluted below DL
* = Surr. rec. outside control limits

AFCEE
ANALYSES DATA SHEET 2
RESULTS

Pace Sample No.: 602762726

Client Sample ID: EX1-007 **Date Collected:** 07/27/99

Analytical Method: EPA 8015 Mod Ext **Date Received:** 07/28/99

Matrix: Soil **Date Extracted :** 07/28/99

Percent Moisture: 26.1 **Date Analyzed:** 07/31/99

Compound	MDL	PQL	Units	Dilution	Results	Qualifier
Diesel Fuel		13.0	mg/kg	0.94		U
Jet Fuel		13.0	mg/kg	0.94		U
n-Tetracosane (S)			%	0.74	83.0	
p-Terphenyl (S)			%	0.74	57.0	

Comments:

D = Surrogate diluted below DL

*** = Surr. rec. outside control limits**

AFCEE
ANALYSES DATA SHEET 2
RESULTS

Pace Sample No.: 602762734
Client Sample ID: EX1-008
Analytical Method: EPA 8015 Mod Ext
Matrix: Soil
Percent Moisture: 29.9

Date Collected: 07/27/99
Date Received: 07/28/99
Date Extracted : 07/28/99
Date Analyzed: 07/31/99

Compound	MDL	PQL	Units	Dilution	Results	Qualifier
Diesel Fuel		14.0	mg/kg	0.98		U
Jet Fuel		14.0	mg/kg	0.98		U
n-Tetracosane (S)			%	0.70	80.0	
p-Terphenyl (S)			%	0.70	56.0	

Comments:

D = Surrogate diluted below DL
* = Surr. rec. outside control limits

AFCEE
ANALYSES DATA SHEET 2
RESULTS

Pace Sample No.: 602762742
Client Sample ID: EX1-009
Analytical Method: EPA 8015 Mod Ext
Matrix: Soil
Percent Moisture: 27.7

Date Collected: 07/27/99
Date Received: 07/28/99
Date Extracted : 07/28/99
Date Analyzed: 07/31/99

Compound	MDL	PQL	Units	Dilution	Results	Qualifier
Diesel Fuel		13.0	mg/kg	0.94		U
Jet Fuel		13.0	mg/kg	0.94		U
n-Tetracosane (S)			%	0.72	78.0	
p-Terphenyl (S)			%	0.72	54.0	

Comments:

D = Surrogate diluted below DL
*** = Surr. rec. outside control limits**

AFCEE
ANALYSES DATA SHEET 2
RESULTS

Pace Sample No.: 602762759

Client Sample ID: EX1-010

Analytical Method: EPA 8015 Mod Ext

Matrix: Soil

Percent Moisture: 26.5

Date Collected: 07/27/99

Date Received: 07/28/99

Date Extracted : 07/28/99

Date Analyzed: 07/31/99

Compound	MDL	PQL	Units	Dilution	Results	Qualifier
Diesel Fuel		14.0	mg/kg	1.00		U
Jet Fuel		14.0	mg/kg	1.00		U
n-Tetracosane (S)			%	0.74	78.0	
p-Terphenyl (S)			%	0.74	56.0	

Comments:

D = Surrogate diluted below DL

* = Surr. rec. outside control limits

AFCEE
ANALYSES DATA SHEET 2
RESULTS

Pace Sample No.: 602762767
Client Sample ID: EX1-011
Analytical Method: EPA 8015 Mod Ext
Matrix: Soil
Percent Moisture: 26.1

Date Collected: 07/27/99
Date Received: 07/28/99
Date Extracted : 07/28/99
Date Analyzed: 07/31/99

Compound	MDL	PQL	Units	Dilution	Results	Qualifier
Diesel Fuel		13.0	mg/kg	0.96		U
Jet Fuel		13.0	mg/kg	0.96		U
n-Tetracosane (S)			%	0.74	71.0	
p-Terphenyl (S)			%	0.74	48.0	

Comments:

D = Surrogate diluted below DL
* = Surr. rec. outside control limits

AFCEE
ANALYSES DATA SHEET 2
RESULTS

Pace Sample No.: 602762775
Client Sample ID: EX1-012
Analytical Method: EPA 8015 Mod Ext
Matrix: Soil
Percent Moisture: 18.8

Date Collected: 07/27/99
Date Received: 07/28/99
Date Extracted : 07/28/99
Date Analyzed: 07/31/99

Compound	MDL	PQL	Units	Dilution	Results	Qualifier
Diesel Fuel		11.0	mg/kg	0.90		U
Jet Fuel		11.0	mg/kg	0.90		U
n-Tetracosane (S)			%	0.81	62.0	*
p-Terphenyl (S)			%	0.81	40.0	

Comments:

D = Surrogate diluted below DL
* = Surr. rec. outside control limits

AFCEE
ANALYSES DATA SHEET 2
RESULTS

Pace Sample No.: 602762957

Client Sample ID: EX1-RINS-01

Analytical Method: EPA 8015 Mod Ext

Matrix: Water

Percent Moisture:

Date Collected: 07/27/99

Date Received: 07/28/99

Date Extracted : 07/29/99

Date Analyzed: 07/31/99

Compound	MDL	PQL	Units	Dilution	Results	Qualifier
Diesel Fuel		1.00	mg/l	1.00		U
Jet Fuel		1.00	mg/l	1.00		U
n-Tetracosane (S)			%	1.00	88.0	
p-Terphenyl (S)			%	1.00	69.0	

Comments:

D = Surrogate diluted below DL

* = Surr. rec. outside control limits

Project Narrative

PACE Project No. *6032433*

This report details any difficulties encountered during the preparation and analysis of samples for this project. The issues addressed will include: out-of-control QC sample parameters, instrument calibration complications, method blank contaminations, unusual sample preparation notations, dilutions required as a result of sample matrix interference or limited sample volume, and any additional information that is necessary to explain discrepancies between the data presented and the QC objectives in the QAPP.

Please note that this report only contains information regarding problems encountered with the analyses. If a particular QC element is not addressed, all specifications presented in the QAPP were satisfied for that issue.

OA2 for Soil

QCSample No. (if applicable)

Date Occured 6569

Miscellaneous (Explain in detail)

A second source verification standard was not analyzed for Jet Fuel on ICAL 07/19/99, KS101.

Affected Samples	Affected Analytes
602762668	Jet Fuel
602762676	
602762684	
602762692	
602762700	
602762718	
602762726	
602762734	
602762742	
602762759	
602762767	
602762775	
602762957	

QCSample No. (if applicable)

Date Occured 6568

Surrogate recovery outlier below the lower control limit

The surrogate recovery for n-Tetracosane (S) is below the AFCEE QAPP lower control limit (71-121). The secondary surrogate p-Terphenyl is in compliance for the control limit criterion.

Affected Samples	Affected Analytes
602762775	n-Tetracosane (S)

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The Chain-of-Custody is a LEGAL DOCUMENT. All relev[illegible] must be completed accurately.

443903 6032433

Page: 1 of 2

Section A — Required Client Information:

Company: R&R International, Inc.
Address: 1234 Cleveland Massillon Rd
AKRON, OH 44321
Phone: 330-666-2200 Fax: 330-666-7874

Section B — Required Client Information:

Report To: Rick Callahan
Invoice To: Rick Callahan
PO: —
Project Name: Parsons
Project Number: AR2705

Client Information (Check quote/contract)
Requested Due Date: 29 JUL 99 NOON | TAT: 24 HRS
* Under 14 day turnaround subject to laboratory and contractual obligations and may result in a Rush Turnaround Surcharge
Turn Around Time (TAT) in calendar days.

Section C — To Be Completed by Pace Analytical and Client

Quote Reference:
Project Manager:
Project #:
Profile #:
Requested Analysis:

Section D — Required Client Information.

Valid Matrix Codes: MATRIX: WATER, SOIL, OIL, WIPE, AIR, TISSUE, OTHER — CODE: WT, SL, OL, WP, AR, TS, OT

SAMPLE ID
One character per box. (A-Z, 0-9 / , -)
Sample IDs MUST BE UNIQUE

ITEM #	SAMPLE ID	MATRIX CODE	DATE COLLECTED (dd / mm / yy)	TIME COLLECTED (military)	# Containers	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	BTEX	GRO	DRO	8015	8015	Remarks / Lab ID
1	EX1-001	SL	27/07/99	0800	3	X						X	X	X			602762668
2	EX1-002	SL		0815	3	X						X	X	X			602762676
3	EX1-003	SL		0825	3	X						X	X	X			602762684
4	EX1-004	SL		0940	3	X						X	X	X			602762692
5	EX1-005	SL		0950	3	X						X	X	X			602762700
6	EX1-006	SL		1005	3	X						X	X	X			602762718
7	EX1-007	SL		1020	6	X						X	X	X			602762726 PRIMARY AND MS/MSD SAMPLE
8	EX1-008	SL		1035	3	X						X	X	X			602762734
9	EX1-009	SL		1010	3	X						X	X	X			602762742
10	EX1-010	SL		1050	3	X						X	X	X			602762759
11	EX1-011	SL		1105	3	X						X	X	X			602762767
12	EX1-012	SL	27/07/99	1130	3	X						X	X	X			602762775

Sample Condition		Sample Notes	Item No.	Relinquished By / Company	Date	Time	Accepted By / Company	Date	Time
Temp in °C:									
Received on ICE:	Y / N								
Sealed Cooler:	Y / N								
Samples Intact:	Y / N								

Additional Comments:

DRO - DIESEL RANGE ORGANICS
GRO - GASOLINE RANGE ORGANICS

PROJECT MANAGER: ANDREA

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: TED HARTFELDER (PARSONS ES)
SIGNATURE of SAMPLER:
DATE Signed (MM / DD / YY): 07/27/99

SEE REVERSE FOR INSTRUCTIONS

Pace Analytical Services

COC01 XLS 08/98

ORIGINAL

FEDEX EXPRESS AIRBILL N[illegible]

Pace Analytical

The Right ... istry, The Right Solution®

CHAIN-OF-CUSTODY / Analytical Request Document

The Ch... Custody is a LEGAL DOCUMENT. All relevant fields must be complete... ly.

443904 032433

Page: 2 of 2

Required Client Information: Section A

Company: PER International, Inc.
Address: 1231 Cleveland-Massillon Rd.
Akron, OH 44321
Phone: 330-666-2200 Fax: 330-666-7874

Required Client Information: Section B

Report To: Rick Callahan
Invoice To: Rick Callahan
PO: —
Project Name: Parsons
Project Number: AR27.05

To Be Completed by Pace Analytical and Client: Section C

Quote Reference:
Project Manager:
Project #:
Profile #:

Client Information (Check quote/contract):
Requested Due Date: 27 JULY 99 NOON | TAT: 24 HOUR

* Under 14 day turnaround subject to laboratory and contractual obligations and may result in a Rush Turnaround Surcharge.

Turn Around Time (TAT) in calender days.

Requested Analysis

Section D Required Client Information:

SAMPLE ID

One character per box:
(A-Z, 0-9 / -)
Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
WATER	WT
SOIL	SL
OIL	OL
WIPE	WP
AIR	AR
TISSUE	TS
OTHER	OT

ITEM #	SAMPLE ID	MATRIX CODE	DATE COLLECTED (dd / mm / yy)	TIME COLLECTED (HRS)	# Containers	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	BTEX CRO DRO	Remarks / Lab ID
1	EX1-RINS-01	WT	27/07/99	0840	5	X			X			X X X	602762957
2	EX1-TRIP-01	WT	27/07/99	0730	2	X						X LABORATORY PREPARED TRIP BLANK	602762965
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													

Sample Condition		Sample Notes	Item No.	Relinquished By / Company	Date	Time	Accepted By / Company	Date	Time
Temp in °C:							Connie L. Dore	7/28/99	09...
Received on ICE:	Y / N								
Sealed Cooler:	Y / N								
Samples Intact:	Y / N								

Additional Comments: CRO - GASOLINE RANGE ORGANICS
DRO - DIESEL RANGE ORGANICS

PACE PROJECT MANAGER - ANDREA

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: TED HARTFELDER (PARSONS ES)
SIGNATURE of SAMPLER: Ted Hartfelder
DATE Signed (MM / DD / YY): 07/27/99

SEE REVERSE SIDE FOR INSTRUCTIONS

Rec'd 8/25/99

R & R International

SDG: 6032541

EPA 8260

Data Deliverable

AFCEE
ORGANIC ANALYSES DATA PACKAGE

Analytical Method: EPA 8260 **AAB #:** 67178

Lab Name: PASI, Kansas City **Contract #:** 6032541

Base/Command: **Prime Contractor:** R & R INTERNATI

Field Sample ID	Lab Sample ID
EX1-013	602772600
EX1-014	602772618
EX1-015	602772626
EX1-016	602772634
EX1-TRIP-02	602772642

Comments:

I certify this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature:

Signature: _____ Name: _____

Date: _____ Title: _____

AFCEE
ANALYSES DATA SHEET 2
RESULTS

Pace Sample No.: 602772600
Client Sample ID: EX1-013
Analytical Method: EPA 8260
Matrix: Soil
Percent Moisture: 23.7

Date Collected: 07/30/99
Date Received: 07/31/99
Date Extracted :
Date Analyzed: 08/03/99

Compound	MDL	PQL	Units	Dilution	Results	Qualifier
Benzene	0.676	6.9	ug/kg	1.05		U
Ethylbenzene	3.56	6.9	ug/kg	1.05	59.0 J	
Toluene	0.580	6.9	ug/kg	1.05		U
Xylene (Total)	8.56	6.9	ug/kg	1.05		U
1,2-Dichloroethane-d4 (S)			%	0.76	68.0	
4-Bromofluorobenzene (S)			%	0.76	278	*
Dibromofluoromethane (S)			%	0.76	64.0	*
Toluene-d8 (S)			%	0.76	228	*

Comments:

D = Surrogate diluted below DL
* = Surr. rec. outside control limits

AFCEE
ANALYSES DATA SHEET 2
RESULTS

Pace Sample No.: 602772618
Client Sample ID: EX1-014
Analytical Method: EPA 8260
Matrix: Soil
Percent Moisture: 26.1

Date Collected: 07/30/99
Date Received: 07/31/99
Date Extracted :
Date Analyzed: 08/03/99

Compound	MDL	PQL	Units	Dilution	Results	Qualifier
Benzene	0.696	7.1	ug/kg	1.05		U
Ethylbenzene	3.66	7.1	ug/kg	1.05		U
Toluene	0.596	7.1	ug/kg	1.05		U
Xylene (Total)	8.8	7.1	ug/kg	1.05		U
1,2-Dichloroethane-d4 (S)			%	0.74	113	
4-Bromofluorobenzene (S)			%	0.74	121	
Dibromofluoromethane (S)			%	0.74	99.0	
Toluene-d8 (S)			%	0.74	95.0	

Comments:

D = Surrogate diluted below DL
* = Surr. rec. outside control limits

AFCEE
ANALYSES DATA SHEET 2
RESULTS

Pace Sample No.: 602772626
Client Sample ID: EX1-015
Analytical Method: EPA 8260
Matrix: Soil
Percent Moisture: 15

Date Collected: 07/30/99
Date Received: 07/31/99
Date Extracted :
Date Analyzed: 08/03/99

Compound	MDL	PQL	Units	Dilution	Results	Qualifier
Benzene	2.55	26.0	ug/kg	4.35	27.0	
Ethylbenzene	13.4	26.0	ug/kg	4.35	310	
Toluene	2.18	26.0	ug/kg	4.35		U
Xylene (Total)	32.2	26.0	ug/kg	4.35		U
1,2-Dichloroethane-d4 (S)			%	0.85	100	
4-Bromofluorobenzene (S)			%	0.85	135	
Dibromofluoromethane (S)			%	0.85	91.0	
Toluene-d8 (S)			%	0.85	104	

Comments:

D = Surrogate diluted below DL
* = Surr. rec. outside control limits

AFCEE
ANALYSES DATA SHEET 2
RESULTS

Pace Sample No.: 602772634
Client Sample ID: EX1-016
Analytical Method: EPA 8260
Matrix: Soil
Percent Moisture: 29.6

Date Collected: 07/30/99
Date Received: 07/31/99
Date Extracted :
Date Analyzed: 08/03/99

Compound	MDL	PQL	Units	Dilution	Results	Qualifier
Benzene	0.725	7.4	ug/kg	1.05		U
Ethylbenzene	3.82	7.4	ug/kg	1.05		U
Toluene	0.622	7.4	ug/kg	1.05		U
Xylene (Total)	9.18	7.4	ug/kg	1.05		U
1,2-Dichloroethane-d4 (S)			%	0.70	99.0	
4-Bromofluorobenzene (S)			%	0.70	128	
Dibromofluoromethane (S)			%	0.70	98.0	
Toluene-d8 (S)			%	0.70	103	

Comments:

D = Surrogate diluted below DL
* = Surr. rec. outside control limits

AFCEE
ANALYSES DATA SHEET 2
RESULTS

Pace Sample No.: 602772642
Client Sample ID: EX1-TRIP-02
Analytical Method: EPA 8260
Matrix: Water
Percent Moisture:

Date Collected: 07/30/99
Date Received: 07/31/99
Date Extracted :
Date Analyzed: 08/02/99

Compound	MDL	PQL	Units	Dilution	Results	Qualifier
Benzene	0.875	5.00	ug/l	1.00		U
Ethylbenzene	1.17	5.00	ug/l	1.00		U
Toluene	0.455	5.00	ug/l	1.00		U
Xylene (Total)	0.330	5.00	ug/l	1.00		U
4-Bromofluorobenzene (S)			%	1.00	120	
Dibromofluoromethane (S)			%	1.00	98.0	
Toluene-d8 (S)			%	1.00	96.0	

Comments:

D = Surrogate diluted below DL
* = Surr. rec. outside control limits

Project Narrative

PACE Project No. *6032541*

This report details any difficulties encountered during the preparation and analysis of samples for this project. The issues addressed will include: out-of-control QC sample parameters, instrument calibration complications, method blank contaminations, unusual sample preparation notations, dilutions required as a result of sample matrix interference or limited sample volume, and any additional information that is necessary to explain discrepancies between the data presented and the QC objectives in the QAPP.

Please note that this report only contains information regarding problems encountered with the analyses. If a particular QC element is not addressed, all specifications presented in the QAPP were satisfied for that issue.

GC/MS VOC's in Soil

QCSample No. (if applicable) **602776148**

Date Occured 08/02/1999 6714

Internal Standard Area outside specification (GC/MS)

Despite low internal standard area recoveries for the LCS duplicate, recoveries and RPDs were within limits. No further action was taken.

Affected Samples	Affected Analytes
602772600	
602772618	
602772626	
602772634	

QCSample No. (if applicable)

Date Occured 08/03/1999 6662

Miscellaneous (Explain in detail)

There was no matrix spike run with this project. A laboratory control sample and duplicate were used instead.

Affected Samples	Affected Analytes
602772600	
602772618	
602772626	
602772634	

1

QCSample No.
(if applicable)

Date Occured 08/03/1999 6660

Surrogate recovery outlier above the upper control limit

Surrogate recovery exceeded limits for the listed analytes. The sample was previously analyzed, but due to low internal standard area recoveries required reanalysis. No further action was taken. This is a matrix effect.

Affected Samples	Affected Analytes
602772600	4-Bromofluorobenzene (S)
	Toluene-d8 (S)

QCSample No.
(if applicable)

Date Occured 08/03/1999 6661

Surrogate recovery outlier below the lower control limit

Surrogate recovery was below control limits for the listed analyte. The sample was previously analyzed but due to low internal standard area recoveries the sample required reanalysis. No further action was taken. This is a matrix effect.

Affected Samples	Affected Analytes
602772600	Dibromofluoromethane (S)

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6032541

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

443905

Page: | of |

Required Client Information: Section A

Company: R&R INTERNATIONAL, INC.
Address: 1234 CLEVELAND MASSILLON RD
AKRON, OHIO 44321
Phone: (330) 666-2200 Fax: (330) 666-7874

Required Client Information: Section B

Report To: RICK CALLAHAN
Invoice To: RICK CALLAHAN
P.O.: —
Project Name: PARSONS
Project Number: AR27

Client Information (Check quote/contract):
Requested Due Date: 04AUG99/0800HRS *TAT: 24 HRS
* Under 14 day turnaround subject to laboratory and contractual obligations and may result in a Rush Turnaround Surcharge.
Turn Around Time (TAT) in calendar days.

To Be Completed by Pace Analytical and Client Section C

Quote Reference:
Project Manager:
Project #:
Profile #:

Section D Required Client Information:

SAMPLE ID
One character per box.
(A–Z, 0–9 / .–)
Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
WATER	WT
SOIL	SL
OIL	OL
WIPE	WP
AIR	AR
TISSUE	TS
OTHER	OT

Requested Analysis: BTEX, GRO 8015M, DRO 8015M

ITEM #	SAMPLE ID	MATRIX CODE	DATE COLLECTED (dd / mm / yy)	TIME COLLECTED (mm:hh a/m) (HRS)	# Containers	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	BTEX	GRO 8015M	DRO 8015M	Remarks / Lab ID
1	EX1-013	SL	30/07/99	1010	3	X	3GN					X	X	X	602772600
2	EX1-014	SL		1020	3	X	3GN					X	X	X	602772618
3	EX1-015	SL		1035	3	X	3GN					X	X	X	602772626
4	EX1-016	SL		1050	3	X	3GN					X	X	X	602772634
5	EX1-TRIP-02	WT	30/07/99	1010	2	HV			X			X	LABORATORY PREPARED TRIP BLANK		602772642
6															
7															
8															
9															
10															
11															
12															

Sample Condition		Sample Notes	Item No.	Relinquished By / Company	Date	Time	Accepted By / Company	Date	Time
Temp in °C:							Abraham Tiregna	7/31/99	0900
Received on ICE:	Y / N								
Sealed Cooler:	Y / N								
Samples Intact:	Y / N								

Additional Comments:

DRO - DIESEL RANGE ORGANICS
GRO - GASOLINE RANGE ORGANICS
PACE PROJECT MANAGER: ANDREA

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: TED HARTFELDER (PARSONS ES)
SIGNATURE of SAMPLER: Ted Hartfelder
DATE S[illegible] (MM / DD / YY): 07[illegible]

SEE REVERSE SIDE FOR INSTRUCTIONS

R & R INTERNATIONAL

SDG 6032541

Data Deliverable

EPA 8015 Modified

AFCEE
ORGANIC ANALYSES DATA PACKAGE

Analytical Method: EPA 8015 Modified **AAB #:** 67170

Lab Name: PASI, Kansas City **Contract #:** ~~6032541~~ F41624-94-D-8041

Base/Command: **Prime Contractor:** R & R INTERNATI

Field Sample ID	Lab Sample ID
EX1-013	602772600
EX1-014	602772618
EX1-015	602772626
EX1-016	602772634

Comments:

I certify this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature:

Signature: _____ Name: _____

Date: _____ Title: _____

AFCEE
ANALYSES DATA SHEET 2
RESULTS

Pace Sample No.: 602772600
Client Sample ID: EX1-013
Analytical Method: EPA 8015 Modified
Matrix: Soil
Percent Moisture: 23.7

Date Collected: 07/30/99
Date Received: 07/31/99
Date Extracted :
Date Analyzed: 08/03/99

Compound	MDL	PQL	Units	Dilution	Results	Qualifier
Gasoline Range Hydrocarbons	0.650	1.3	mg/kg	1.00	40.0	B
4-Bromofluorobenzene (S)			%	0.76	103	

Comments:

D = Surrogate diluted below DL
*** = Surr. rec. outside control limits**

AFCEE
ANALYSES DATA SHEET 2
RESULTS

Pace Sample No.: 602772618
Client Sample ID: EX1-014
Analytical Method: EPA 8015 Modified
Matrix: Soil
Percent Moisture: 26.1

Date Collected: 07/30/99
Date Received: 07/31/99
Date Extracted :
Date Analyzed: 08/03/99

Compound	MDL	PQL	Units	Dilution	Results	Qualifier
Gasoline Range Hydrocarbons	0.700	1.4	mg/kg	1.00	1.8 U	B
4-Bromofluorobenzene (S)			%	0.74	106	

Comments:

D = Surrogate diluted below DL
*** = Surr. rec. outside control limits**

AFCEE
ANALYSES DATA SHEET 2
RESULTS

Pace Sample No.: 602772626

Client Sample ID: EX1-015 **Date Collected:** 07/30/99

Analytical Method: EPA 8015 Modified **Date Received:** 07/31/99

Matrix: Soil **Date Extracted :**

Percent Moisture: 15 **Date Analyzed:** 08/03/99

Compound	MDL	PQL	Units	Dilution	Results	Qualifier
Gasoline Range Hydrocarbons	0.600	1.2	mg/kg	1.00	66.0	B
4-Bromofluorobenzene (S)			%	0.85	104	

Comments:

D = Surrogate diluted below DL

*** = Surr. rec. outside control limits**

AFCEE
ANALYSES DATA SHEET 2
RESULTS

Pace Sample No.: 602772634
Client Sample ID: EX1-016
Analytical Method: EPA 8015 Modified
Matrix: Soil
Percent Moisture: 29.6

Date Collected: 07/30/99
Date Received: 07/31/99
Date Extracted :
Date Analyzed: 08/03/99

Compound	MDL	PQL	Units	Dilution	Results	Qualifier
Gasoline Range Hydrocarbons	0.700	1.4	mg/kg	1.00	2.9 U	B
4-Bromofluorobenzene (S)			%	0.70	101	

Comments:

D = Surrogate diluted below DL
*** = Surr. rec. outside control limits**

Project Narrative

PACE Project No. ***6032541***

This report details any difficulties encountered during the preparation and analysis of samples for this project. The issues addressed will include: out-of-control QC sample parameters, instrument calibration complications, method blank contaminations, unusual sample preparation notations, dilutions required as a result of sample matrix interference or limited sample volume, and any additional information that is necessary to explain discrepancies between the data presented and the QC objectives in the QAPP.

Please note that this report only contains information regarding problems encountered with the analyses. If a particular QC element is not addressed, all specifications presented in the QAPP were satisfied for that issue.

TPH Gas

QCSample No. (if applicable)

Date Occured 6626

Miscellaneous (Explain in detail)

The surrogate retention time for method EPA 8015 Modified is slightly outside the 0.07 minute guideline referenced to the initial calibration of May 24, 1999, instrument KS111.

Affected Samples	Affected Analytes
602772600	
602772618	
602772626	
602772634	

Date Occured 6625

Miscellaneous (Explain in detail)

Pace Analytical Services and R & R International have a mutual agreement of a 5.0 mg/kg PRL for the soil samples of SDG 6032541. Due to the rush analysis requested by the client for method EPA 8015 Modified, the current a-code containing a PRL of 1.0 mg/kg was used to check in the soil samples of SDG 6032541. As a result, the AFCEE FORM O-2 indicates blank contamination due to the associated method blank contains gasoline at 1.5 mg/kg. Please disregard the "B" flag on the AFCEE FORM O-2 and note the actual PRL for the soil samples of SDG 6032541 is 5.0 mg/kg.

Affected Samples	Affected Analytes
602772600	Gasoline Range Hydrocarbons
602772618	
602772626	
602772634	

Pace Analytical

The Right Chemistry, The Right Solution®

6032541

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

443905

Page: | of |

Required Client Information: Section A

Company: R&R INTERNATIONAL, INC.
Address: 1234 CLEVELAND MASSILLON RD
AKRON, OHIO 44321
Phone: (330) 666-2200 Fax: (330) 666-7874

Required Client Information: Section B

Report To: RICK CALLAHAN
Invoice To: RICK CALLAHAN
P.O. —
Project Name: PARSONS
Project Number: AR27

Client Information (Check quote/contract):
Requested Due Date/TAT: 04AUG99/0800HRS 24 HRS

* Under 14 day turnaround subject to laboratory and contractual obligations and may result in a Rush Turnaround Surcharge.

Turn Around Time (TAT) in calendar days.

To Be Completed by Pace Analytical and Client Section C

Quote Reference:
Project Manager:
Project #:
Profile #:

Section D Required Client Information:

SAMPLE ID

One character per box.
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
WATER	WT
SOIL	SL
OIL	OL
WIPE	WP
AIR	AR
TISSUE	TS
OTHER	OT

ITEM #	SAMPLE ID	MATRIX CODE	DATE COLLECTED dd / mm / yy	TIME COLLECTED (HRS) mm:hh a/m	# Containers	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Requested Analysis: BTEX	GRO 8015M	DRO 8015M	Remarks / Lab ID
1	EX1-013	SL	30/07/99	1010	3		3					X	X	X	602772600
2	EX1-014	SL		1020	3		3					X	X	X	602772618
3	EX1-015	SL		1035	3		3					X	X	X	602772626
4	EX1-016	SL		1050	3		3					X	X	X	602772634
5	EX1-TRIP-02	WT	30/07/99	1010	2				X			X	LABORATORY PREPARED TRIP BLANK		602772642
6															
7															
8															
9															
10															
11															
12															

Sample Condition		Sample Notes	Item No.	Relinquished By / Company	Date	Time	Accepted By / Company	Date	Time
Temp in °C:							Abraham Tiegna	7/31/99	0900
Received on ICE:	Y / N								
Sealed Cooler:	Y / N								
Samples Intact:	Y / N								

Additional Comments:

DRO- DIESEL RANGE ORGANICS
GRO- GASOLINE RANGE ORGANICS
PACE PROJECT MANAGER: ANDREA

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: TED HARTFELDER (PARSONS ES)
SIGNATURE of SAMPLER: Ted Hartfelder
DATE Signed (MM / DD / YY): 07

SEE REVERSE SIDE FOR INSTRUCTIONS

R & R INTERNATIONAL

SDG 6032541

Data Deliverable

EPA 8015 Modified Ext.

AFCEE
ORGANIC ANALYSES DATA PACKAGE

Analytical Method: EPA 8015 Mod Ext **AAB #:** 67158

Lab Name: PASI, Kansas City **Contract #:** 6032541

Base/Command: **Prime Contractor:** R & R INTERNATI

Field Sample ID	Lab Sample ID
EX1-013	602772600
EX1-014	602772618
EX1-015	602772626
EX1-016	602772634

Comments:

I certify this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature:

Signature: _____ Name: _____

Date: _____ Title: _____

AFCEE
ANALYSES DATA SHEET 2
RESULTS

Pace Sample No.: 602772600

Client Sample ID: EX1-013

Analytical Method: EPA 8015 Mod Ext

Matrix: Soil

Percent Moisture: 23.7

Date Collected: 07/30/99

Date Received: 07/31/99

Date Extracted : 08/02/99

Date Analyzed: 08/03/99

Compound	MDL	PQL	Units	Dilution	Results	Qualifier
Diesel Fuel		13.0	mg/kg	0.98		U
n-Tetracosane (S)			%	0.76	82.0	
p-Terphenyl (S)			%	0.76	52.0	

Comments:

D = Surrogate diluted below DL

*** = Surr. rec. outside control limits**

AFCEE
ANALYSES DATA SHEET 2
RESULTS

Pace Sample No.: 602772618
Client Sample ID: EX1-014
Analytical Method: EPA 8015 Mod Ext
Matrix: Soil
Percent Moisture: 26.1

Date Collected: 07/30/99
Date Received: 07/31/99
Date Extracted : 08/02/99
Date Analyzed: 08/03/99

Compound	MDL	PQL	Units	Dilution	Results	Qualifier
Diesel Fuel		13.0	mg/kg	1.00		U
n-Tetracosane (S)			%	0.74	84.0	
p-Terphenyl (S)			%	0.74	57.0	

Comments:

D = Surrogate diluted below DL
* = Surr. rec. outside control limits

AFCEE
ANALYSES DATA SHEET 2
RESULTS

Pace Sample No.: 602772626

Client Sample ID: EX1-015 **Date Collected:** 07/30/99

Analytical Method: EPA 8015 Mod Ext **Date Received:** 07/31/99

Matrix: Soil **Date Extracted :** 08/02/99

Percent Moisture: 15 **Date Analyzed:** 08/03/99

Compound	MDL	PQL	Units	Dilution	Results	Qualifier
Diesel Fuel		11.0	mg/kg	0.97		U
n-Tetracosane (S)			%	0.85	86.0	
p-Terphenyl (S)			%	0.85	56.0	

Comments:

D = Surrogate diluted below DL

* = Surr. rec. outside control limits

AFCEE
ANALYSES DATA SHEET 2
RESULTS

Pace Sample No.: 602772634
Client Sample ID: EX1-016
Analytical Method: EPA 8015 Mod Ext
Matrix: Soil
Percent Moisture: 29.6

Date Collected: 07/30/99
Date Received: 07/31/99
Date Extracted : 08/02/99
Date Analyzed: 08/03/99

Compound	MDL	PQL	Units	Dilution	Results	Qualifier
Diesel Fuel		14.0	mg/kg	0.97		U
n-Tetracosane (S)			%	0.70	84.0	
p-Terphenyl (S)			%	0.70	56.0	

Comments:

D = Surrogate diluted below DL
* = Surr. rec. outside control limits

Project Narrative

PACE Project No. *6032541*

This report details any difficulties encountered during the preparation and analysis of samples for this project. The issues addressed will include: out-of-control QC sample parameters, instrument calibration complications, method blank contaminations, unusual sample preparation notations, dilutions required as a result of sample matrix interference or limited sample volume, and any additional information that is necessary to explain discrepancies between the data presented and the QC objectives in the QAPP.

Please note that this report only contains information regarding problems encountered with the analyses. If a particular QC element is not addressed, all specifications presented in the QAPP were satisfied for that issue.

OA2 for Soil

QCSample No. (if applicable)

Date Occured 6593

Miscellaneous (Explain in detail)

The quality control batch for SDG 6032541 consists of a method blank and a Laboratory Control Sample due to the rush analysis requested by the client for method OA2.

Affected Samples	Affected Analytes
602772600	
602772618	
602772626	
602772634	

1

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

6032541

443905

Page: | of |

To Be Completed by Pace Analytical and Client

Section A — Required Client Information:

Company: R&R INTERNATIONAL, INC.
Address: 1234 CLEVELAND MASSILLON RD
AKRON, OHIO 44321
Phone: (330) 666-2200 Fax: (330) 666-7874

Section B — Required Client Information:

Report To: RICK CALLAHAN
Invoice To: RICK CALLAHAN
P.O. —
Project Name: PARSONS
Project Number: AR27

Client Information (Check quote/contract):
Requested Due Date: 04AUG99/0800HRS *TAT: 24 HRS
* Under 14 day turnaround subject to laboratory and contractual obligations and may result in a Rush Turnaround Surcharge.
Turn Around Time (TAT) in calendar days.

Section C

Quote Reference:
Project Manager:
Project #:
Profile #:

Section D — Required Client Information:

SAMPLE ID
One character per box.
(A–Z, 0–9 / .–)
Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
WATER	WT
SOIL	SL
OIL	OL
WIPE	WP
AIR	AR
TISSUE	TS
OTHER	OT

Requested Analysis: BTEX, GRO 8015M, DRO 8015M

ITEM #	SAMPLE ID	MATRIX CODE	DATE COLLECTED (dd / mm / yy)	TIME COLLECTED (mm:hh a/m)	# Containers	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Remarks / Lab ID
1	EX1-013	SL	30/07/99	1010	3	X	3GN					602772600
2	EX1-014	SL		1020	3	X	3GN					602772618
3	EX1-015	SL		1035	3	X	3GN					602772626
4	EX1-016	SL		1050	3	X	3GN					602772634
5	EX1-TRIP-02	WT	30/07/99	1010	2	HV			X			LABORATORY PREPARED TRIP BLANK 602772642
6												
7												
8												
9												
10												
11												
12												

Sample Condition		Sample Notes	Item No.	Relinquished By / Company	Date	Time	Accepted By / Company	Date	Time
Temp in °C:							Abraham Tiegna	7/31/99	0900
Received on ICE:	Y / N								
Sealed Cooler:	Y / N								
Samples Intact:	Y / N								

Additional Comments:

DRO- DIESEL RANGE ORGANICS
GRO- GASOLINE RANGE ORGANICS
PACE PROJECT MANAGER: ANDREA

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: TED HARTFELDER (PARSONS ES)
SIGNATURE of SAMPLER: Ted Hartfelder
DATE Signed: (MM / DD / YY) 07/30/99

SEE REVERSE SIDE FOR INSTRUCTIONS

Received 01/06/11

R&R International

SDG 6032820

Method 8260

Data Deliverable

Sample Association Summary

EPA 8260

PASI Project #: 6032820 **Matrix:** Soil

Sample Description	PASI Sample Number
EX1-017	602797565
EX1-018	602797573
EX1-TRIP-03	602797557

AFCEE
ANALYSES DATA SHEET 2
RESULTS

Pace Sample No.: 602797557
Client Sample ID: EX1-TRIP-03
Analytical Method: EPA 8260
Matrix: Water
Percent Moisture:

Date Collected: 08/09/99
Date Received: 08/11/99
Date Extracted :
Date Analyzed: 08/11/99

Compound	MDL	PQL	Units	Dilution	Results	Qualifier
Benzene	0.875	5.00	ug/l	1.00		U
Ethylbenzene	1.17	5.00	ug/l	1.00		U
Toluene	0.455	5.00	ug/l	1.00		U
Xylene (Total)	0.330	5.00	ug/l	1.00		U
4-Bromofluorobenzene (S)			%	1.00	122	
Dibromofluoromethane (S)			%	1.00	89.0	
Toluene-d8 (S)			%	1.00	107	

Comments:

D = Surrogate diluted below DL
*** = Surr. rec. outside control limits**

AFCEE
ANALYSES DATA SHEET 2
RESULTS

Pace Sample No.: 602797565
Client Sample ID: EX1-017
Analytical Method: EPA 8260
Matrix: Soil
Percent Moisture: 29.5

Date Collected: 08/09/99
Date Received: 08/11/99
Date Extracted :
Date Analyzed: 08/12/99

Compound	MDL	PQL	Units	Dilution	Results	Qualifier
Benzene	2.45	25.0	ug/kg	3.47	630	
Ethylbenzene	12.9	25.0	ug/kg	3.47	800	
Toluene	2.1	25.0	ug/kg	3.47	450	
Xylene (Total)	31.0	25.0	ug/kg	3.47	3300	
1,2-Dichloroethane-d4 (S)			%	0.70	103	
4-Bromofluorobenzene (S)			%	0.70	129	
Dibromofluoromethane (S)			%	0.70	91.0	
Toluene-d8 (S)			%	0.70	104	

Comments:

D = Surrogate diluted below DL

*** = Surr. rec. outside control limits**

AFCEE
ANALYSES DATA SHEET 2
RESULTS

Pace Sample No.: 602797573
Client Sample ID: EX1-018
Analytical Method: EPA 8260
Matrix: Soil
Percent Moisture: 30

Date Collected: 08/09/99
Date Received: 08/11/99
Date Extracted :
Date Analyzed: 08/12/99

Compound	MDL	PQL	Units	Dilution	Results	Qualifier
Benzene	3.53	36.0	ug/kg	5.00	310	
Ethylbenzene	18.6	36.0	ug/kg	5.00	730	
Toluene	3.02	36.0	ug/kg	5.00	1200	
Xylene (Total)	44.6	36.0	ug/kg	5.00	5300	
1,2-Dichloroethane-d4 (S)			%	0.70	101	
4-Bromofluorobenzene (S)			%	0.70	123	
Dibromofluoromethane (S)			%	0.70	92.0	
Toluene-d8 (S)			%	0.70	104	

Comments:

D = Surrogate diluted below DL
*** = Surr. rec. outside control limits**

Project Narrative

PACE Project No. ***6032820***

This report details any difficulties encountered during the preparation and analysis of samples for this project. The issues addressed will include: out-of-control QC sample parameters, instrument calibration complications, method blank contaminations, unusual sample preparation notations, dilutions required as a result of sample matrix interference or limited sample volume, and any additional information that is necessary to explain discrepancies between the data presented and the QC objectives in the QAPP.

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GC/MS VOC's in Soil

QCSample No. (if applicable) **602776148**

Date Occured 08/02/1999 6714

Internal Standard Area outside specification (GC/MS)

Despite low internal standard area recoveries for the LCS duplicate, recoveries and RPDs were within limits. No further action was taken.

Affected Samples	Affected Analytes
602797565	
602797573	

QCSample No. (if applicable)

Date Occured 08/03/1999 6662

Miscellaneous (Explain in detail)

There was no matrix spike run with this project. A laboratory control sample and duplicate were used instead.

Affected Samples	Affected Analytes
602797565	
602797573	

1

The Right Ch ry. The Right Solution*

6032820 (BTEX)

The Chain ustody is a LEGAL DOCUMENT. All relevant fields must be completed acc

6032822 (DRO/GRO)

Page: 1 of 1

496106

To Be Completed by Pace Analytical and Client

Required Clie mation: **Section A**

Company: R&R INTERNATIONAL, INC.
Address: 1234 CLEVELAND MASSILLON RD
AKRON, OHIO 44321
Phone: (330) 666-2200 Fax: (330) 666-7874

Required Client Information: **Section B**

Report To: RICK CALLAHAN
Invoice To: RICK CALLAHAN
P.O.: —
Project Name: PARSONS
Project Number: AR27

PER JOHN HICKS (PARSONS ES)

Client Information (Check quote/contract):
Requested Due Date: ~~18 AUG 99~~ TAT: ~~7 DAYS~~

* Under 14 day turnaround subject to laboratory and contractual obligations and may result in a Rush Turnaround Surcharge.
Turn Around Time (TAT) in calender days.

Section C

Quote Reference:
Project Manager:
Project #:
Profile #:

Requested Analysis: BTEX, GRO 8015M, DRO 8015M

Section D Required Client Information:

SAMPLE ID
One character per box.
(A–Z, 0–9 / -)
Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
WATER	WT
SOIL	SL
OIL	OL
WIPE	WP
AIR	AR
TISSUE	TS
OTHER	OT

ITEM #	SAMPLE ID	MATRIX CODE	DATE COLLECTED (mm / dd / yy)	TIME COLLECTED (HRS)	# Containers	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Remarks / Lab ID
1	EX1-TRIP-03	W	08/09/99	1300	2	2 PV		X			X	LABORATORY PREPARED TRIP BLANK 602797557
2	EX1-017	SL	08/09/99	1600	3	X	3 GN				X X X	602797565 / 602797656
3	EX1-018	SL	08/09/99	1530	3	X	3 GN				X X X	602797573 / 602797698
4												
5												
6												
7												
8												
9												
10												
11												
12												

Sample Condition		Sample Notes	Item No.	Relinquished By / Company	Date	Time	Accepted By / Company	Date	Time
Temp in °C:									
Received on ICE:	Y / N							8/11/99	1000
Sealed Cooler:	Y / N								
Samples Intact:	Y / N								

Additional Comments:
DRO - DIESEL RANGE ORGANICS
GRO - GASOLINE RANGE ORGANICS

PACE PROJECT MANAGER: ANDREA

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER: TED HARTFELDER (PARSONS ES)
SIGNATURE of SAMPLER:
DATE Signed: (MM / DD / YY) 09 AUG 99

SEE REVERSE SIDE FOR INSTRUCTIONS

FEDERAL EXPRESS AIRBILL 808563612240

ORIGINAL

Received 8/30/99

R & R INTERNATIONAL

SDG 6032822

Data Deliverable

EPA 8015 Modified Ext

AFCEE

ORGANIC ANALYSES DATA PACKAGE

Analytical Method: EPA 8015 Mod Ext **AAB #:** 67956

Lab Name: PASI, Kansas City **Contract #:** ~~6032822~~ F416024-04-D-8004

Base/Command: **Prime Contractor:** R & R INTERNATI

Field Sample ID	Lab Sample ID
EX1-017	602797656
EX1-018	602797698

Comments:

I certify this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature:

Signature: _____ Name: _____

Date: _____ Title: _____

AFCEE
ANALYSES DATA SHEET 2
RESULTS

Pace Sample No.: 602797656
Client Sample ID: EX1-017
Analytical Method: EPA 8015 Mod Ext
Matrix: Soil
Percent Moisture: 30.9

Date Collected: 08/09/99
Date Received: 08/11/99
Date Extracted : 08/16/99
Date Analyzed: 08/19/99

Compound	MDL	PQL	Units	Dilution	Results	Qualifier
Diesel Fuel		14.0	mg/kg	1.00		U
Jet Fuel		14.0	mg/kg	1.00		U
n-Tetracosane (S)			%	0.69	97.0	
p-Terphenyl (S)			%	0.69	101	

Comments:

D = Surrogate diluted below DL
* = Surr. rec. outside control limits

AFCEE
ANALYSES DATA SHEET 2
RESULTS

Pace Sample No.: 602797698

Client Sample ID: EX1-018

Analytical Method: EPA 8015 Mod Ext

Matrix: Soil

Percent Moisture: 30.8

Date Collected: 08/09/99

Date Received: 08/11/99

Date Extracted : 08/16/99

Date Analyzed: 08/19/99

Compound	MDL	PQL	Units	Dilution	Results	Qualifier
Diesel Fuel		14.0	mg/kg	1.00		U
Jet Fuel		14.0	mg/kg	1.00		U
n-Tetracosane (S)			%	0.69	101	
p-Terphenyl (S)			%	0.69	100	

Comments:

D = Surrogate diluted below DL

*** = Surr. rec. outside control limits**

Project Narrative

PACE Project No. *6032822*

This report details any difficulties encountered during the preparation and analysis of samples for this project. The issues addressed will include: out-of-control QC sample parameters, instrument calibration complications, method blank contaminations, unusual sample preparation notations, dilutions required as a result of sample matrix interference or limited sample volume, and any additional information that is necessary to explain discrepancies between the data presented and the QC objectives in the QAPP.

Please note that this report only contains information regarding problems encountered with the analyses. If a particular QC element is not addressed, all specifications presented in the QAPP were satisfied for that issue.

OA2 for Soil

QCSample No. (if applicable)

Date Occured 6722

Miscellaneous (Explain in detail)

The OQS designated for the analysis of a Matrix Spike and Matrix Spike Duplicate is not client specific to SDG 6032822. The OQS for QC batch 67956 is referenced on the Analysis Sequence form, only.

Affected Samples	Affected Analytes
602797656	
602797698	

Date Occured 6718

Miscellaneous (Explain in detail)

A second source verification standard for Jet Fuel was not analyzed for ICAL 08/19/99, KS103.

Affected Samples	Affected Analytes
602797656	Jet Fuel
602797698	

6032820 (BTEX) AND 6032822 (DRO/GRO)

Required Client Information: **Section A**

Company: R&R [redacted] ERNATIONAL, INC.
Address: 1234 CLEVELAND MASSILLON RD
AKRON, OHIO 44321
Phone: (330) 666-2200 Fax: (330) 666-7874

Required Client Information: **Section B**

Report To: RICK CALLAHAN
Invoice To: RICK CALLAHAN
P.O.: —
Project Name: PARSONS
Project Number: AR27

Page: 1 of 1

[redacted] PER JOHN HICKS (PARSONS ES)
Client Information (Check quote/contract):
Requested Due Date: 18 AUG 99
*TAT: 7 DAYS

* Under 14 day turnaround subject to laboratory and contractual obligations and may result in a Rush Turnaround Surcharge.
Turn Around Time (TAT) in calender days.

496106

To Be Completed by Pace Analytical and C[redacted] **Section C**

Quote Reference:
Project Manager:
Project #:
Profile #:

Requested Analysis: BTEX, GRO 8015M, DRO 8015M

Section D Required Client Information:

SAMPLE ID
One character per box.
(A-Z, 0-9 / .-)
Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
WATER	WT
SOIL	SL
OIL	OL
WIPE	WP
AIR	AR
TISSUE	TS
OTHER	OT

ITEM #	SAMPLE ID	MATRIX CODE	DATE COLLECTED mm / dd / yy	TIME COLLECTED (HRS)	# Containers	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Remarks / Lab ID
1	EX1-TRIP-03	W	08/09/99	1300	2	2 VOA		X			X	LABORATORY PREPARED TRIP BLANK / 602797557
2	EX1-017	SL	08/09/99	1600	3	X	3 GLN				X X X	602797565 / 602797656
3	EX1-018	SL	08/09/99	1530	3	X	3 GLN				X X X	602797573 / 602797698
4												
5												
6												
7												
8												
9												
10												
11												
12												

Sample Condition		Sample Notes	Item No.	Relinquished By / Company	Date	Time	Accepted By / Company	Date	Time
Temp in °C:									
Received on ICE:	Y / N							8/11/99	1000
Sealed Cooler:	Y / N								
Samples Intact:	Y / N								

Additional Comments:
DRO - DIESEL RANGE ORGANICS
GRO - GASOLINE RANGE ORGANICS

PACE PROJECT MANAGER: ANDREA

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER: TED HARTFELDER (PARSONS ES)
SIGNATURE of SAMPLER:
DATE Signed: (MM / DD / YY) 09 AUG 99

SEE REVERSE SIDE FOR INSTRUCTIONS

FEDERAL EXPRESS AIRBILL 808563612240

ORIGINAL

Received 6/30/99

R & R INTERNATIONAL

SDG 6032822

Data Deliverable

EPA 8015 Modified

AFCEE
ORGANIC ANALYSES DATA PACKAGE

Analytical Method: EPA 8015 Modified **AAB #:** 67921

Lab Name: PASI, Kansas City **Contract #:** ~~6032822~~ F41624-94-D-8014

Base/Command: **Prime Contractor:** R & R INTERNATI

Field Sample ID	Lab Sample ID
EX1-017	602797656
EX1-018	602797698

Comments:

I certify this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature:

Signature: _____ Name: _____

Date: _____ Title: _____

AFCEE
ANALYSES DATA SHEET 2
RESULTS

Pace Sample No.: 602797656
Client Sample ID: EX1-017
Analytical Method: EPA 8015 Modified
Matrix: Soil
Percent Moisture: 30.9

Date Collected: 08/09/99
Date Received: 08/11/99
Date Extracted :
Date Analyzed: 08/17/99

Compound	MDL	PQL	Units	Dilution	Results	Qualifier
Gasoline Range Hydrocarbons	0.700	1.4	mg/kg	1.00	6.4	
4-Bromofluorobenzene (S)			%	0.69	116	

Comments:

D = Surrogate diluted below DL
*** = Surr. rec. outside control limits**

AFCEE
ANALYSES DATA SHEET 2
RESULTS

Pace Sample No.: 602797698
Client Sample ID: EX1-018
Analytical Method: EPA 8015 Modified
Matrix: Soil
Percent Moisture: 30.8

Date Collected: 08/09/99
Date Received: 08/11/99
Date Extracted :
Date Analyzed: 08/17/99

Compound	MDL	PQL	Units	Dilution	Results	Qualifier
Gasoline Range Hydrocarbons	0.700	1.4	mg/kg	1.00	51.0	
4-Bromofluorobenzene (S)			%	0.69	118	

Comments:

D = Surrogate diluted below DL
* = Surr. rec. outside control limits

Project Narrative

PACE Project No. *6032822*

This report details any difficulties encountered during the preparation and analysis of samples for this project. The issues addressed will include: out-of-control QC sample parameters, instrument calibration complications, method blank contaminations, unusual sample preparation notations, dilutions required as a result of sample matrix interference or limited sample volume, and any additional information that is necessary to explain discrepancies between the data presented and the QC objectives in the QAPP.

Please note that this report only contains information regarding problems encountered with the analyses. If a particular QC element is not addressed, all specifications presented in the QAPP were satisfied for that issue.

TPH Gas

QCSample No. (if applicable)

Date Occured 6724

Miscellaneous (Explain in detail)

Pace Analytical Services and R & R International have a mutual agreement of a 5.0 mg/kg PRL for the soil samples of SDG 6032822. Due to the rush analysis requested by the client for method EPA 8015 Modified, the current a-code containing a PRL of 1.0 mg/kg was used to check in the soil samples of SDG 6032822. As a result, the AFCEE FORM O-6 indicates blank contamination of gasoline at 3.0 mg/kg. The associated sample data do not reflect a "B" flag on the AFCEE FORM O-2.

Affected Samples	Affected Analytes
602797656	
602797698	

Date Occured 6626

Miscellaneous (Explain in detail)

The surrogate retention time for method EPA 8015 Modified is slightly outside the 0.07 minute guideline referenced to the initial calibration of May 24, 1999, instrument KS111.

Affected Samples	Affected Analytes
602797656	
602797698	

1

"Right Chemistry, The Right Solution"

6032820 (BTEX) AN 6032822 (DRO/GRO)

496106

Page: 1 of 1

Required Client Information: **Section A**

Company: R&R INTERNATIONAL, INC.
Address: 1234 CLEVELAND MASSILLON RD
AKRON, OHIO 44321
Phone: (330) 666-2200 Fax: (330) 666-7874

Required Client Information: **Section B**

Report To: RICK CALLAHAN
Invoice To: RICK CALLAHAN
P.O.: —
Project Name: PARSONS
Project Number: AR27

PER JOHN HICKS (PARSONS ES)

Client Information (Check quote/contract):
Requested Due Date: 18 AUG 99
*TAT: 7 DAYS

* Under 14 day turnaround subject to laboratory and contractual obligations and may result in a Rush Turnaround Surcharge.

Turn Around Time (TAT) In calender days.

To Be Completed by Pace Analytical and C... **Section C**

Quote Reference:
Project Manager:
Project #:
Profile #:

Requested Analysis:

Section D Required Client Information:

SAMPLE ID

One character per box.
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
WATER	WT
SOIL	SL
OIL	OL
WIPE	WP
AIR	AR
TISSUE	TS
OTHER	OT

ITEM #	SAMPLE ID	MATRIX CODE	DATE COLLECTED mm / dd / yy	TIME COLLECTED (HRS)	# Containers	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	BTEX	GRO 8015M	DRO 8015M	Remarks / Lab ID
1	EX1-TRIP-03	W	08/09/99	1300	2	2PV		X				X			LABORATORY PREPARED TRIP BLANK 602797557
2	EX1-017	SL	08/09/99	1600	3	X	3GN					X	X	X	602797565 / 602797656
3	EX1-018	SL	08/09/99	1530	3	X	3GN					X	X	X	602797583 / 602797698
4															
5															
6															
7															
8															
9															
10															
11															
12															

Sample Condition		Sample Notes	Item No.	Relinquished By / Company	Date	Time	Accepted By / Company	Date	Time
Temp in °C:									
Received on ICE:	Y / N							8/11/99	1000
Sealed Cooler:	Y / N								
Samples Intact:	Y / N								

Additional Comments:

DRO - DIESEL RANGE ORGANICS
GRO - GASOLINE RANGE ORGANICS

PACE PROJECT MANAGER: ANDREA

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: TED HARTFELDER (PARSONS ES)
SIGNATURE of SAMPLER:
DATE Signed: (MM / DD / YY) 09 AUG 99

SEE REVERSE SIDE FOR INSTRUCTIONS

FEDERAL EXPRESS AIRBILL 808563612240

ORIGINAL

Pace Analytical Services, Inc. Form COC01.XLS 08/98

APPENDIX B

BORING LOGS, WELL CONSTRUCTION DIAGRAMS, MONITORING WELL DEVELOPMENT FORMS, AND SAMPLE COLLECTION FORMS

BORING LOGS AND WELL CONSTRUCTION DIAGRAMS: PHASE I

Parsons Engineering Science, Inc.

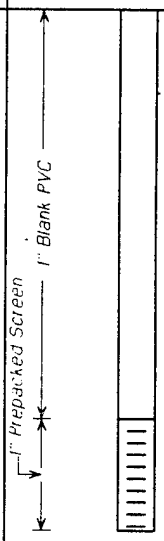
St. Louis, Missouri

Log of Monitoring Well DT-1

Project: *Former Military Gas Station*	Location: *Eaker AFB, Arkansas*
Project Number: *734786*	GS Elevation: *105.98 ft. from arbitrary datum*
Date Started: *11/19/98*	Initial Water Lev: *ft. TOC*
Date Finished: *11/19/98*	Final Water Lev: *7.95 ft. TOC*
Drill Method: *Geoprobe*	TOTAL DEPTH: *14.5 Feet*
Drill Company: *Parsons ES*	Geologist: *Lee Gorday*

DEPTH feet	SAMPLE NO.	PID (ppm) VALUES	PID (ppm) PROFILE (0 – 1000)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
0					SP	FILL, SAND, some SILT, medium gray, loose.
5	DT-1	45				
10		175				
		115			SP	FILL, SAND, little SILT, very wet.
15		125				Refusal encountered at 14.5 feet, interpreted to be concrete foundation. Collect DT-1 from 4 to 12 feet with MS/MSD.
20						
25						
30						

WELL DIAGRAM



Parsons Engineering Science, Inc. St. Louis, Missouri	Log of Boring DT-2
Project: *Former Military Gas Station*	Location: *Eaker AFB, Arkansas*
Project Number: *734786*	GS Elevation: *ft. MSL*
Date Started: *11/19/98*	Initial Water Lev: *ft. TOC*
Date Finished: *11/19/98*	Final Water Lev: *ft. TOC*
Drill Method: *Geoprobe*	TOTAL DEPTH: *6 Feet*
Drill Company: *Parsons ES*	Geologist: *Lee Gorday*

DEPTH feet	SAMPLE NO.		PID (ppm) VALUES	PID (ppm) PROFILE 0 1000	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	REMARKS
0						SP	FILL, mix of SAND, little SILT, gray to brown, loose.	
5	DT-2		34 440				Refusal at 6 feet. Interpreted to be tank foundation. Sample DT-2 collected from 4 to 6 feet.	
10								
15								
20								
25								
30								
35								

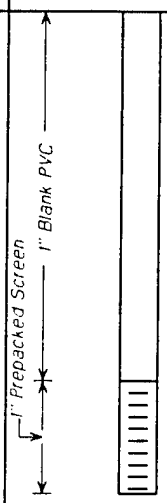
Parsons Engineering Science, Inc. St. Louis, Missouri	Log of Boring DT-3
Project: *Former Military Gas Station*	Location: *Eaker AFB, Arkansas*
Project Number: *734786*	GS Elevation: *ft. MSL*
Date Started: *11/19/98*	Initial Water Lev: *ft. TOC*
Date Finished: *11/19/98*	Final Water Lev: *ft. TOC*
Drill Method: *Geoprobe*	TOTAL DEPTH: *8 Feet*
Drill Company: *Parsons ES*	Geologist: *Lee Gorday*

DEPTH feet	SAMPLE NO.	PID (ppm) VALUES	PID (ppm) PROFILE 0 1000	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	REMARKS
0	DT-3	850			SP	FILL, SAND, some SILT, gray to brown, loose.	
5						FILL, SAND, some SILT, medium gray, loose.	
		518				Total depth of hole 8 feet. Sample DT-3 collected from 3 to 8 feet, including field duplicate labeled P-14.	
10							
15							
20							
25							
30							

Parsons Engineering Science, Inc. St. Louis, Missouri	Log of Monitoring Well DT-4
Project: *Former Military Gas Station*	Location: *Eaker AFB, Arkansas*
Project Number: *734786*	GS Elevation: *106.17 ft. arbitrary datum*
Date Started: *11/19/98*	Initial Water Lev: *10.76 ft. TOC*
Date Finished: *11/19/98*	Final Water Lev: *7.96 ft. TOC*
Drill Method: *Geoprobe*	TOTAL DEPTH: *16 Feet*
Drill Company: *Parsons ES*	Geologist: *Lee Gorday*

DEPTH feet	SAMPLE NO.	PID (ppm) VALUES	PID (ppm) PROFILE (0 – 1000)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
0					ML	FILL, mix of SILT and GRAVEL, loose, gray.
		270			ML	SILT, some CLAY, medium to dark gray.
		58			ML	SILT, little CLAY, dark olive, moist
5		36				
		41				SILT, dark olive gray, wet at 8.5 feet, becoming brownish at 11 feet.
10		10				
		5				SILT, brown, very wet.
	DT-4	6				
15		8				Total depth 16 feet. Sample DT-4 collected from 14 to 16 feet. Precacked screen installed from 9.7 to 12.7 feet.
20						
25						
30						
35						

WELL DIAGRAM



Parsons Engineering Science, Inc.

St. Louis, Missouri

Log of Boring RT-1

Project: *Former Military Gas Station*	Location: *Eaker AFB, Arkansas*
Project Number: *734786*	GS Elevation: *ft. MSL*
Date Started: *11/20/98*	Initial Water Lev: *ft. TOC*
Date Finished: *11/20/98*	Final Water Lev: *ft. TOC*
Drill Method: *Geoprobe*	TOTAL DEPTH: *16 Feet*
Drill Company: *Parsons ES*	Geologist: *Lee Gorday*

DEPTH feet	SAMPLE NO.	PID (ppm) VALUES	PID (ppm) PROFILE 0 1000	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	REMARKS
0		2			ML	FILL; SILT and GRAVEL, loose, brown.	
		22			ML	SILT, some SAND, medium olive gray, moist.	
5		16			ML	SILT, some SAND and CLAY, medium olive. Moist thoroughout, except wet from 8 to 9 feet.	
		16					
10		22					
	RT-1	13			ML	CLAY and SILT, wet, gray to medium brown.	
15		16					
		2				Total depth 16 feet. Sample RT-1 collected from 13 to 14 feet.	
20							
25							
30							
35							

Parsons Engineering Science, Inc.

St. Louis, Missouri

Log of Boring RT-2

Project: *Former Military Gas Station*	Location: *Eaker AFB, Arkansas*
Project Number: *734786*	GS Elevation: *ft. MSL*
Date Started: *11/20/98*	Initial Water Lev: *ft. TOC*
Date Finished: *11/20/98*	Final Water Lev: *ft. TOC*
Drill Method: *Geoprobe*	TOTAL DEPTH: *16 Feet*
Drill Company: *Parsons ES*	Geologist: *Lee Gorday*

DEPTH feet	SAMPLE NO.	PID (ppm) VALUES	PID (ppm) PROFILE 0 1000	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	REMARKS
0					ML	FILL, SILT and GRAVEL, loose, brown.	
					ML	SILT, some SAND and CLAY, moist.	
5		26			ML	SILT, some SAND and CLAY, trace GRAVEL, moist.	
	RT-2	117				No Recovery 8 to 12 feet.	
10					ML	SILT, some SAND and CLAY, trace GRAVEL.	
15		6			ML	SILT, some SAND and CLAY, laminated, mottled dark gray and medium brown.	
						Total depth 16 feet. Sample RT-2 collected from 7 to 8 feet.	
20							
25							
30							
35							

Parsons Engineering Science, Inc.

St. Louis, Missouri

Log of Boring RT-3

Project: *Former Military Gas Station*	Location: *Eaker AFB, Arkansas*
Project Number: *734786*	GS Elevation: *ft. MSL*
Date Started: *11/20/98*	Initial Water Lev: *ft. TOC*
Date Finished: *11/20/98*	Final Water Lev: *ft. TOC*
Drill Method: *Geoprobe*	TOTAL DEPTH: *8 Feet*
Drill Company: *Parsons ES*	Geologist: *Lee Gorday*

DEPTH feet	SAMPLE NO.	PID (ppm) VALUES	PID (ppm) PROFILE 0 · 1000	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	REMARKS
					ML	FILL, SILT and GRAVEL mix, loose, brown.	
					SP	SAND, well graded, brown, moist.	
		5					
5					ML	SILT, some SAND, gray.	
	RT-3						
					ML	SILT, some SAND and CLAY, gray.	
		80	■			Total depth 8 feet. Sample RT-3 collected from 7 to 8 feet.	
10							
15							
20							
25							
30							
35							

Parsons Engineering Science, Inc. St. Louis, Missouri	Log of Boring RT-4
Project: *Former Military Gas Station*	Location: *Eaker AFB, Arkansas*
Project Number: *734786*	GS Elevation: *ft. MSL*
Date Started: *11/20/98*	Initial Water Lev: *ft. TOC*
Date Finished: *11/20/98*	Final Water Lev: *ft. TOC*
Drill Method: *Geoprobe*	TOTAL DEPTH: *8 Feet*
Drill Company: *Parsons ES*	Geologist: *Lee Gorday*

DEPTH feet	SAMPLE NO.	PID (ppm) VALUES	PID (ppm) PROFILE 0 2000	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	REMARKS
0					SP	FILL, SAND, lenses of SILT, medium grayish brown.	
5	RT-3	72					
		36				Total depth 8 feet. Sample RT-4 collected from 7 to 8 feet.	
10							
15							
20							
25							
30							
35							

Parsons Engineering Science, Inc.

St. Louis, Missouri

Log of Boring UT-1

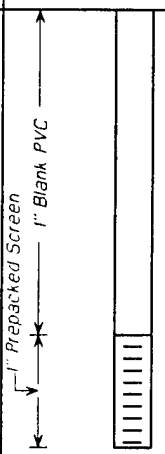
Project: *Former Military Gas Station*	Location: *Eaker AFB, Arkansas*
Project Number: *734786*	GS Elevation: *ft. MSL*
Date Started: *11/19/98*	Initial Water Lev: *ft. TOC*
Date Finished: *11/19/98*	Final Water Lev: *ft. TOC*
Drill Method: *Geoprobe*	TOTAL DEPTH: *13 Feet*
Drill Company: *Parsons ES*	Geologist: *Lee Gorday*

DEPTH feet	SAMPLE NO.	PID (ppm) VALUES	PID (ppm) PROFILE (0 – 2000)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	REMARKS
					SM	FILL, mix of SAND and GRAVEL, light color, loose.	
		6			SM	SAND, brown, well graded, moist, loose.	
		6			ML	SILT, some SAND and GRAVEL, dark gray, moist, soft.	
5		8				FILL, mix SILT with some SAND and GRAVEL, dark brown and dark gray, very moist.	
		11				FILL, mix SILT, SAND and GRAVEL, mottled, very moist.	
10		12			ML	FILL, GRAVEL and SAND, medium gray, stained dark from 11.5 to 12 feet, wet.	
	UT-1	1800				Same as above.	
						Refusal at 13 feet. Interpreted to be tank foundation. Sample UT-1 collected from 11.5 to 13 feet.	
15							
20							
25							
30							

Parsons Engineering Science, Inc. St. Louis, Missouri	Log of Monitoring Well UT-2
Project: *Former Military Gas Station*	Location: *Eaker AFB, Arkansas*
Project Number: *734786*	GS Elevation: *106.57 ft. arbitrary datum*
Date Started: *11/19/98*	Initial Water Lev: *10.06 ft. TOC*
Date Finished: *11/19/98*	Final Water Lev: *7.24 ft. TOC*
Drill Method: *Geoprobe*	TOTAL DEPTH: *12 Feet*
Drill Company: *Parsons ES*	Geologist: *Lee Gorday*

DEPTH feet	SAMPLE NO.	PID (ppm) VALUES	PID (ppm) PROFILE 0–250	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
0					ML	FILL, mix of SILT with some SAND and GRAVEL, dark brown and dark gray, moist.
5	UT-2	11.7			ML	FILL, mix of SAND and GRAVEL, dark brown and dark gray, wet.
10		7				Total depth of sampling 8 feet. Sample UT-2 collected from 6 to 8 feet. Monitoring Point installed with screen section from 8.5 to 11.5 feet.
15						
20						
25						
30						
35						

WELL DIAGRAM



Parsons Engineering Science, Inc.

St. Louis, Missouri

Log of Boring UT-3

Project: *Former Military Gas Station*	Location: *Eaker AFB, Arkansas*
Project Number: *734786*	GS Elevation: *ft. MSL*
Date Started: *11/19/98*	Initial Water Lev: *ft. TOC*
Date Finished: *11/19/98*	Final Water Lev: *ft. TOC*
Drill Method: *Geoprobe*	TOTAL DEPTH: *12 Feet*
Drill Company: *Parsons ES*	Geologist: *Lee Gorday*

DEPTH feet	SAMPLE NO.	PID (ppm) VALUES	PID (ppm) PROFILE 0 1000	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	REMARKS
5	UT-3	9			ML	FILL, mix of GRAVEL and SILT, medium gray, wet.	
					ML	SILT, traces of SAND and CLAY, mottled, olive and gray. Appears to be fill, moist.	
		6				SILT, traces of SAND and CLAY, moist, mottles olive and gray.	
10		10				Total depth of boring 12 feet. Sample UT-3 collected from 7 to 9 feet.	
15							
20							
25							
30							

Parsons Engineering Science, Inc. St. Louis, Missouri	Log of Boring UT-4
Project: *Former Military Gas Station*	Location: *Eaker AFB, Arkansas*
Project Number: *734786*	GS Elevation: *ft. MSL*
Date Started: *11/19/98*	Initial Water Lev: *9 ft. TOC*
Date Finished: *11/19/98*	Final Water Lev: *ft. TOC*
Drill Method: *Geoprobe*	TOTAL DEPTH: *12 Feet*
Drill Company: *Parsons ES*	Geologist: *Lee Gorday*

DEPTH feet	SAMPLE NO.	PID (ppm) VALUES	PID (ppm) PROFILE 0 1000	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	REMARKS
0					ML	FILL, mix of gravel and clayey silt, damp, loose.	
5		82			ML	SILT, some CLAY, dark olive gray, moist, moderately soft.	
	UT-4	62				SILT, some CLAY, dark olive gray, wet, soft.	
10		4				Total depth of boring 12 feet. Sample UT-4 collected from 7 to 9 feet.	
15							
20							
25							
30							
35							

BORING LOGS AND WELL CONSTRUCTION DIAGRAMS: PHASE II

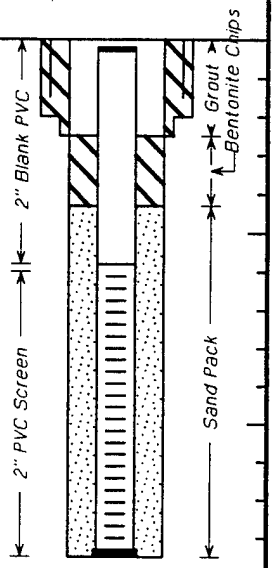
Parsons Engineering Science, Inc.

St. Louis, Missouri

Log of Monitoring Well MW001

PROJECT: *Former Military Gas Station*	LOCATION: *Eaker AFB, Arkansas*
PROJECT NO.: *734786*	SURFACE ELEVATION: *249.85 Top of Casing*
DATE STARTED: *3/30/99*	INITIAL WATER LEVEL: *ft. TOC*
DATE FINISHED: *3/31/99*	STATIC WATER LEVEL: *7.49 ft. TOC*
DRILLING METHOD: *Hollow Stem Auger*	TOTAL DEPTH: *13.5 Feet*
DRILLING COMPANY: *Parsons ES*	GEOLOGIST: *Lee Gorday*

DEPTH feet	SAMPLE NO.		PID (ppm) VALUES	PID (ppm) PROFILE 0 1000	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	WELL DIAGRAM
5							Drilled without sampling (previously sampled as DT4).	
10								
15							TD = 13.5 Top Screen = 5.8 Top Sand = 4.3 Top Bentonite = 2.5 Top Casing = -0.3	
20								
25								
30								



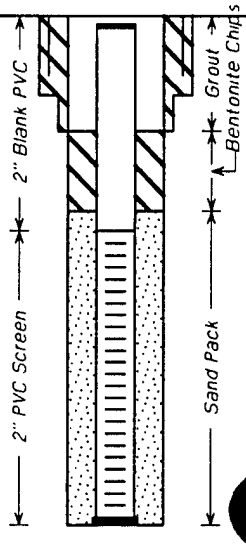
Parsons Engineering Science, Inc.

St. Louis, Missouri

Log of Monitoring Well MW002

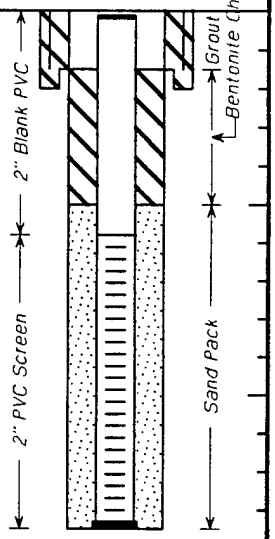
PROJECT: *Former Military Gas Station*	LOCATION: *Eaker AFB, Arkansas*
PROJECT NO.: *734786*	SURFACE ELEVATION: *249.66 Top of Casing*
DATE STARTED: *3/30/99*	INITIAL WATER LEVEL: *ft. TOC*
DATE FINISHED: *3/30/99*	STATIC WATER LEVEL: *7.51 ft. TOC*
DRILLING METHOD: *Hollow Stem Auger*	TOTAL DEPTH: *13.1 Feet*
DRILLING COMPANY: *Parsons ES*	GEOLOGIST: *Lee Gorday*

DEPTH feet	SAMPLE NO.		PID (ppm) VALUES	PID (ppm) PROFILE 0 1000	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	WELL DIAGRAM
5							Drilled without sampling (previously sampled as DT1).	
10								
15							TD = 13.1 Top Screen = 5.4 Top Sand = 4.9 Top Bentonite = 2.9 Top Casing = -0.26	
20								
25								
30								
35								



Parsons Engineering Science, Inc. St. Louis, Missouri	Log of Monitoring Well MW003
PROJECT: *Former Military Gas Station*	LOCATION: *Eaker AFB, Arkansas*
PROJECT NO.: *734786*	SURFACE ELEVATION: *249.67 Top of Casing*
DATE STARTED: *3/30/99*	INITIAL WATER LEVEL: *ft. TOC*
DATE FINISHED: *3/30/99*	STATIC WATER LEVEL: *7.69 ft. TOC*
DRILLING METHOD: *Hollow Stem Auger*	TOTAL DEPTH: *13.5 Feet*
DRILLING COMPANY: *Parsons ES*	GEOLOGIST: *Lee Gorday*

DEPTH feet	SAMPLE NO.		PID (ppm) VALUES	PID (ppm) PROFILE 0 1000	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	WELL DIAGRAM
0							Drilled without sampling (previously sampled as P10).	
5								
10								
15							TD = 13.5 Top Screen = 5.8 Top Sand = 5.0 Top Bentonite = 1.5 Top Casing = -0.18	
20								
25								
30								
35								



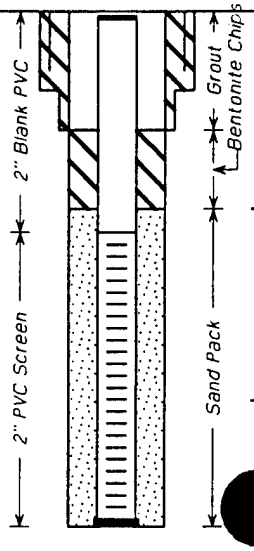
Parsons Engineering Science, Inc.

St. Louis, Missouri

Log of Monitoring Well MW004

PROJECT: *Former Military Gas Station*	LOCATION: *Eaker AFB, Arkansas*
PROJECT NO.: *734786*	SURFACE ELEVATION: *Top of Casing*
DATE STARTED: *3/30/99*	INITIAL WATER LEVEL: *ft. TOC*
DATE FINISHED: *3/30/99*	STATIC WATER LEVEL: *6.14 ft. TOC*
DRILLING METHOD: *Hollow Stem Auger*	TOTAL DEPTH: *13.3 Feet*
DRILLING COMPANY: *Parsons ES*	GEOLOGIST: *Lee Gorday*

DEPTH feet	SAMPLE NO.		PID (ppm) VALUES	PID (ppm) PROFILE 0 1000	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	WELL DIAGRAM
0							Drilled without sampling (previously sampled as RT5).	
5								
10								
15							TD = 13.3 Top Screen = 5.6 Top Sand = 5.0 Top Bentonite = 3.0 Top Casing = -0.2	
20								
25								
30								
35								



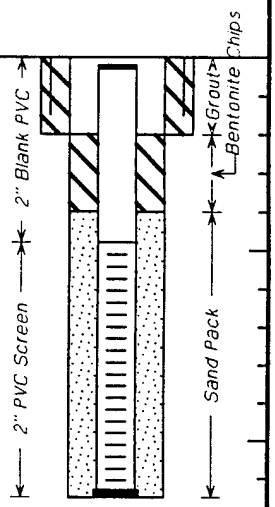
Parsons Engineering Science, Inc.

St. Louis, Missouri

Log of Monitoring Well MW005

PROJECT: *Former Military Gas Station*	LOCATION: *Eaker AFB, Arkansas*
PROJECT NO.: *734786*	SURFACE ELEVATION: *250.17 Top of Casing*
DATE STARTED: *3/31/99*	INITIAL WATER LEVEL: *ft. TOC*
DATE FINISHED: *3/31/99*	STATIC WATER LEVEL: *6.80 ft. TOC*
DRILLING METHOD: *Hollow Stem Auger*	TOTAL DEPTH: *12.2 Feet*
DRILLING COMPANY: *Parsons ES*	GEOLOGIST: *Lee Gorday*

DEPTH feet	SAMPLE NO.		PID (ppm) VALUES	PID (ppm) PROFILE 0 1000	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	WELL DIAGRAM
0							Drilled without sampling (previously sampled as UT2).	
5								
10							Foundation encountered at 12.2	
15							TD = 11.5 Top Screen = 4.8 Top Sand = 4.0 Top Bentonite = 2.0 Top Casing = ~0.3	
20								
25								
30								
35								



Parsons Engineering Science, Inc.

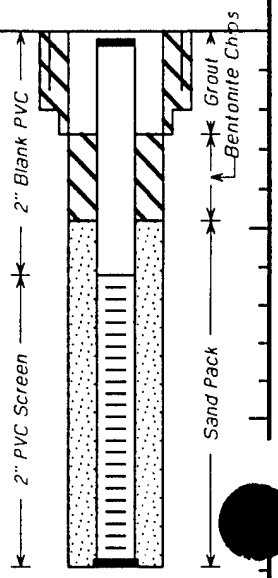
St. Louis, Missouri

Log of Monitoring Well MW006

PROJECT: *Former Military Gas Station*	LOCATION: *Eaker AFB, Arkansas*
PROJECT NO.: *734786*	SURFACE ELEVATION: *248.92 Top of Casing*
DATE STARTED: *4/01/99*	INITIAL WATER LEVEL: *ft. TOC*
DATE FINISHED: *4/01/99*	STATIC WATER LEVEL: *6.58 ft. TOC*
DRILLING METHOD: *Hollow Stem Auger*	TOTAL DEPTH: *13.9 Feet*
DRILLING COMPANY: *Parsons ES*	GEOLOGIST: *Lee Gorday*

DEPTH feet	SAMPLE NO.	% Recovery	PID (ppm) VALUES	PID (ppm) PROFILE (0 – 1000)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
0			3			ML	FILL, SILT some SAND, scattered GRAVEL, soft, damp to moist, dark yellowish brown to yellowish brown.
			89			ML	SILT, little CLAY and SAND, moderately soft, moist, very dark brown to yellowish brown, some vague lamination.
5	30		6			ML	SILT and SAND, soft, wet, some lamination, light yellowish brown and olive gray.
			1				
			2				
10			3			ML	SILT, some SAND, moderately soft, very moist, olive gray and yellowish brown.
			3				SILT, little SAND, moderately firm, sticky, very moist, mottled olive gray and light yellowish brown.
15							TD = 13.9 Top Screen = 6.2 Top Sand = 4.8 Top Bentonite = 2.6 Top Casing = -0.36
20							
25							
30							
35							

WELL DIAGRAM



Parsons Engineering Science, Inc.

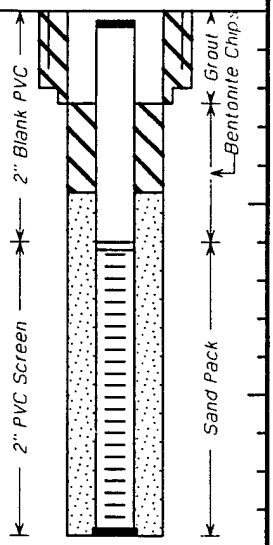
St. Louis, Missouri

Log of Monitoring Well MW007

PROJECT: *Former Military Gas Station*	LOCATION: *Eaker AFB, Arkansas*
PROJECT NO.: *734786*	SURFACE ELEVATION: *248.94 Top of Casing*
DATE STARTED: *4/01/99*	INITIAL WATER LEVEL: *ft. TOC*
DATE FINISHED: *4/01/99*	STATIC WATER LEVEL: *6.51 ft. TOC*
DRILLING METHOD: *Hollow Stem Auger*	TOTAL DEPTH: *13.7 Feet*
DRILLING COMPANY: *Parsons ES*	GEOLOGIST: *Lee Gorday*

DEPTH feet	SAMPLE NO.	% Recovery	PID (ppm) VALUES	PID (ppm) PROFILE 0–1000	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
0						ML	FILL, mix of SILT, SAND and GRAVEL.
5			40				
			89			ML	SILT, little SAND and CLAY, moderately soft, moist, vague lamination, olive gray and light yellowish brown.
			141				
			97				
10			33			ML	SILT, some CLAY, little SAND, very moist, moderately firm, mostly olive gray with some yellowish brown.
15							TD = 13.7 Top Screen = 6.0 Top Sand = 4.7 Top Bentonite = 2.4 Top Casing = −0.42
20							
25							
30							
35							

WELL DIAGRAM



Parsons Engineering Science, Inc.

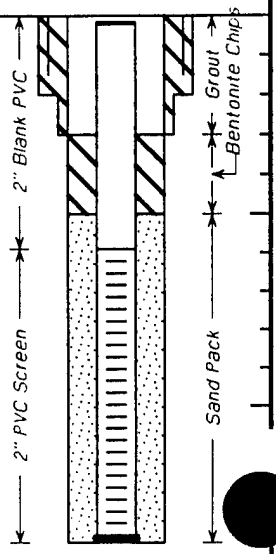
St. Louis, Missouri

Log of Monitoring Well MW008

PROJECT: *Former Military Gas Station*	LOCATION: *Eaker AFB, Arkansas*
PROJECT NO.: *734786*	SURFACE ELEVATION: *249.27 Top of Casing*
DATE STARTED: *3/31/99*	INITIAL WATER LEVEL: *ft. TOC*
DATE FINISHED: *3/31/99*	STATIC WATER LEVEL: *6.59 ft. TOC*
DRILLING METHOD: *Hollow Stem Auger*	TOTAL DEPTH: *13.6 Feet*
DRILLING COMPANY: *Parsons ES*	GEOLOGIST: *Lee Gorday*

DEPTH feet	SAMPLE NO.	% Recovery	PID (ppm) VALUES	PID (ppm) PROFILE 0 1000	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
						ML	FILL, SAND, little SILT, loose, damp, well graded.
			1			ML	SILT, some CLAY, soft, moist dark reddish brown.
			1			ML	SILT and CLAY, moderately soft, moist, yellowish brown.
5	80		2			ML	SILT, some CLAY, little SAND, moderately soft, moist, yellowish brown.
			2				SILT, some to little CLAY, moderately soft to soft, very moist to wet, zones almost liquid.
			3				
10	90		2				SILT, little to some CLAY, moderately firm, laminated, moist, mottled yellowish brown and olive.
			3				
						ML	zone transitional from above to below
			2				SILT and CLAY, firm, medium gray with some yellowish brown.
15							Hole advanced to 15 feet, bottom backfilled with filter sand.
							TD = 13.6 Top Screen = 5.9 Top Sand = 5.0 Top Bentonite = 3.0 Top Casing = -0.22
20							
25							
30							
35							

WELL DIAGRAM



Parsons Engineering Science, Inc.

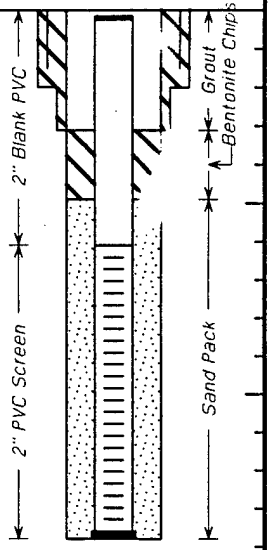
St. Louis, Missouri

Log of Monitoring Well MW009

PROJECT: *Former Military Gas Station*	LOCATION: *Eaker AFB, Arkansas*
PROJECT NO.: *734786*	SURFACE ELEVATION: *250.18 Top of Casing*
DATE STARTED: *3/31/99*	INITIAL WATER LEVEL: *ft. TOC*
DATE FINISHED: *3/31/99*	STATIC WATER LEVEL: *7.04 ft. TOC*
DRILLING METHOD: *Hollow Stem Auger*	TOTAL DEPTH: *13.8 Feet*
DRILLING COMPANY: *Parsons ES*	GEOLOGIST: *Lee Gorday*

DEPTH feet	SAMPLE NO.	% Recovery	PID (ppm) VALUES	PID (ppm) PROFILE 0 1000	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
						ML	FILL, SILT, some CLAY and GRAVEL, firm, damp, dark yellowish brown.
			2			ML	SILT, little SAND and CLAY, firm, damp, dark grayish brown.
			1			ML	SILT, some CLAY, firm, moist, mottled yellowish brown and olive gray.
5	90		2				SILT, some CLAY, little SAND, moderately firm, moist, mottled light yellowish brown and olive gray.
			2				
			1			ML	SILT, some SAND and CLAY, soft, wet, olive gray and yellowish brown.
10	100		2				
			2			ML	SILT and CLAY, firm, some mottling, olive gray with streaks of yellowish brown.
15							TD = 13.8 Top Screen = 6.1 Top Sand = 4.9 Top Bentonite = 3.1 Top Casing = -0.25
20							
25							
30							
35							

WELL DIAGRAM



Parsons Engineering Science, Inc.

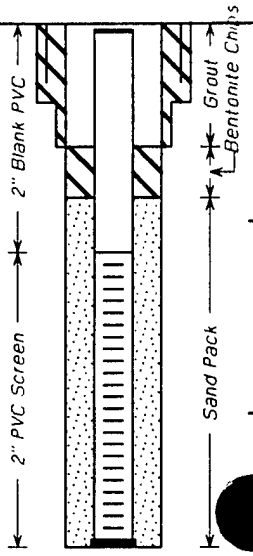
St. Louis, Missouri

Log of Monitoring Well MW010

PROJECT: *Former Military Gas Station*	LOCATION: *Eaker AFB, Arkansas*
PROJECT NO.: *734786*	SURFACE ELEVATION: *249.36 Top of Casing*
DATE STARTED: *3/31/99*	INITIAL WATER LEVEL: *ft. TOC*
DATE FINISHED: *3/31/99*	STATIC WATER LEVEL: *8.00 ft. TOC*
DRILLING METHOD: *Hollow Stem Auger*	TOTAL DEPTH: *13.5 Feet*
DRILLING COMPANY: *Parsons ES*	GEOLOGIST: *Lee Gorday*

DEPTH feet	SAMPLE NO.	% Recovery	PID (ppm) VALUES	PID (ppm) PROFILE 0 1000	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
			3			SM	FILL, SAND and GRAVEL, loose, medium brown.
			4				FILL, SAND and SILT, moist, olive gray.
5			4			ML	SILT, little CLAY and SAND, firm, moist, olive brown.
			4			ML	SILT, some SAND, locally sand and silt, wet at 8, yellowish brown.
			3				
10			3				
			3				SAND, some SILT, loose, wet, medium brown.
15							TD = 13.5 Top Screen = 5.8 Top Sand = 4.4 Top Bentonite = 3.1 Top Casing = -0.22
20							
25							
30							
35							

WELL DIAGRAM



Parsons Engineering Science, Inc.

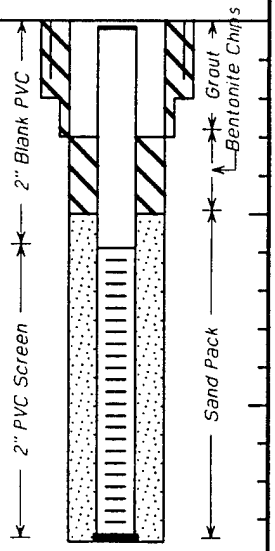
St. Louis, Missouri

Log of Monitoring Well MW011

PROJECT: *Former Military Gas Station*	LOCATION: *Eaker AFB, Arkansas*
PROJECT NO.: *734786*	SURFACE ELEVATION: *249.36 Top of Casing*
DATE STARTED: *3/31/99*	INITIAL WATER LEVEL: *ft. TOC*
DATE FINISHED: *3/31/99*	STATIC WATER LEVEL: *6.39 ft. TOC*
DRILLING METHOD: *Hollow Stem Auger*	TOTAL DEPTH: *13.5 Feet*
DRILLING COMPANY: *Parsons ES*	GEOLOGIST: *Lee Gorday*

DEPTH feet	SAMPLE NO.	% Recovery	PID (ppm) VALUES	PID (ppm) PROFILE 0 1000	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
0						SM	FILL, SAND, loose, damp, medium brown.
			0			ML	SILT, some CLAY, firm, damp, strings of SAND, dark brown with light yellowish brown.
			0				SILT, some CLAY, little SAND, firm, damp, dark brown.
5			1			ML	SILT little CLAY and SAND, moderately firm, moist, mottled light yellowish brown and olive gray.
			2				
			3				SILT, little CLAY and SAND, moderately firm, moist, mottled light yellowish brown and olive gray.
10			3				SILT, little CLAY and SAND, moderately soft, moist, mottled olive gray and brown.
			4				
15							TD = 13.5 Top Screen = 5.8 Top Sand = 4.9 Top Bentonite = 2.8 Top Casing = -0.22
20							
25							
30							
35							

WELL DIAGRAM



Parsons Engineering Science, Inc.

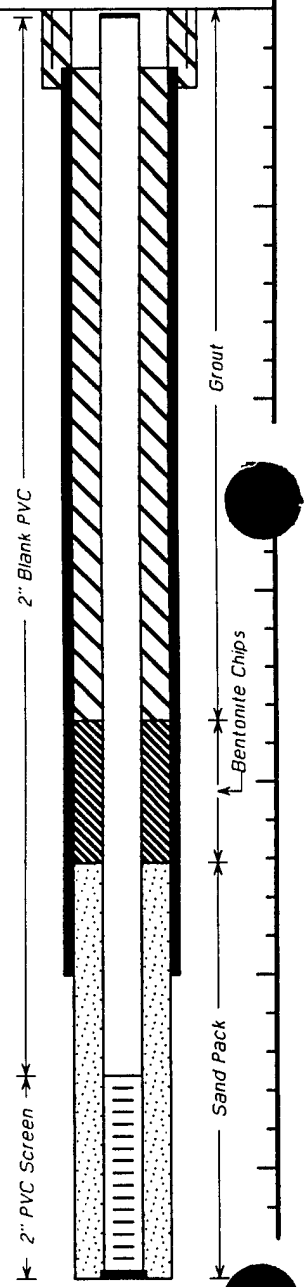
St. Louis, Missouri

Log of Monitoring Well MW012

PROJECT: *Former Military Gas Station*	LOCATION: *Eaker AFB, Arkansas*
PROJECT NO.: *734786*	SURFACE ELEVATION:
DATE STARTED: *3/31/99*	INITIAL WATER LEVEL: *ft. TOC*
DATE FINISHED: *4/1/99*	STATIC WATER LEVEL: *ft. TOC*
DRILLING METHOD: *Hollow Stem Auger*	TOTAL DEPTH: *33 Feet*
DRILLING COMPANY: *Parsons ES*	GEOLOGIST: *Lee Gorday*

DEPTH feet	SAMPLE NO.	PID (ppm) VALUES	PID (ppm) PROFILE 0 1000	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
0					ML	Drilled Blind to 16 feet
15		14			ML	SILT and CLAY, firm, very moist, mottled dark gray with yellowish brown.
		15			ML	CLAY, some SILT, firm, moist, very dark gray, traces olive, blocky fracture, but run is continuous with no discontinuitites.
20		44				
						CLAY, some SILT, as above.
25		38				
		166			ML	SILT, some SAND and CLAY, stiff, moist, very dark gray.
		54			SM	SAND, little SILT, fine to medium grained, loose, wet, medium gray. Drillers report odor on sample opening.
30		137				
		87				TD = 32.8 Feet Top Screen = 27.6 Feet Top Sand = 22.1 Feet Top Bentonite = 18.4 Feet
35						

WELL DIAGRAM



BORING LOGS AND WELL CONSTRUCTION DIAGRAMS: PHASE III

PARSONS
PARSONS ENGINEERING SCIENCE, INC.
Denver, Colorado (303) 831-8100

LOG OF BORING 074-TW009

Risk-Based Approach to Remediation
Former Military Gas Station
Eaker AFB, Arkansas

Drilling Company	: Tri-State	Date Spud	: 6/16/99
Rig Type	: CME-55	Date Completed	: 6/16/99
Drilling Method	: Hollow Stem Auger	Weather	: Sunny, low 80's
Borehole Diameter	: 8 inch	Geologist	: John P. Tunks

Depth in feet	PID (ppm)	GRAPHIC	USCS	DESCRIPTION
0			ML	0-1' light brown, dry, sandy silt
2	-0.4		ML	1'-3' dark brown, dry, silt with a little clay
4			CL	3'-5' orange-brown, damp silty clay
6	-0.2		ML	5'-8' orange brown, moist, sandy silt
8				
10	0.3		ML	8'-15' orange-brown, wet, sandy silt
12				
14				
16	0.0		CL	15'-19' gray, moist, clay with orange staining
18				
20	-0.4		CL	19'-23' dark gray, moist, clay
22				
24	0.3		CL	23'-26' same as above
26			CL	26'-27' same as above with increasing sand (<10%)
28				

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PARSONS
PARSONS ENGINEERING SCIENCE, INC.
Denver, Colorado (303) 831-8100

LOG OF BORING 074-TW010

Risk-Based Approach to Remediation
Former Military Gas Station
Eaker AFB, Arkansas

Drilling Company	: Tri-State	Date Spud	: 6/17/99
Rig Type	: CME-55	Date Completed	: 6/17/99
Drilling Method	: Hollow Stem Auger	Weather	: Sunny, upper 60's
Borehole Diameter	: 8 inch	Geologist	: John P. Tunks

Depth in feet	PID (ppm)	GRAPHIC	USCS	DESCRIPTION
0	0.0		ML	0-1.5' grayish brown, dry, sandy silt with a little gravel cobble
2			SP	1.5-5' orange-brown, damp, sand with some silt
4	-0.8		SP	5'-10' same as above but moist, becoming more silty with depth
6				
8				
10	-0.6		ML	10'-12' gray-brown, moist, silt, some orange staining
12			CL	12'-15' dark blue-gray, moist, clay, some orange staining
14	-0.3		CL	15'-24' same as above but no staining
16				
18				
20	-0.3			
22				
24	-0.3		SW	24'-25.5' gray, moist, fine to medium sand with little clay
26			CL	25.5'-26' same as 15'-24' but with some fine sand
28				

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PARSONS
PARSONS ENGINEERING SCIENCE, INC.
Denver, Colorado (303) 831-8100

LOG OF BORING 074-MW015D; TW011

Risk-Based Approach to Remediation
Former Military Gas Station
Eaker AFB, Arkansas

Drilling Company	: Tri-State	Date Spud	: 6/20/99
Rig Type	: CME-55	Date Completed	: 6/20/99
Drilling Method	: Hollow Stem Auger	Weather	: Overcast, mid 80's
Borehole Diameter	: 8 inch	Geologist	: John P. Tunks

Depth in feet	Surf. Elev. 250.46	PID (ppm)	GRAPHIC	USCS	DESCRIPTION
0	248	0.0		ML	0-1.5' medium brown, dry, silt with little clay, sand and cobbles
				ML	1.5-3' dark brown, dry, silt with some clay
4	244	-0.6		ML	3'-9.5' orange-brown, damp to moist, silt with some clay, becoming more moist with depth
8	240	-0.3		ML	9.5'-12' SAA but wet and increasing in clay content
12	236	-0.8		CL	12'-18' gray-brown, moist, clay with orange staining
16	232	-0.6		CL	18'-25' Dark blue gray, moist to wet, clay
20	228	-0.4		CL	25'-28' gray, moist to wet, clay with some medium sand between 27' and 28'
24	224			SP	28'-33' medium gray-brown, wet, sand with trace to little gray clay
28	220				33'-38' No recovery
32	216			SP	38'-43' No recovery except 1"-2" layer of black coal. Cutting forced out of top of auger consist of 90% medium sands and 10% black coal, small cobbles-pebbles
36	212				43'-48" no recovery
40	208			SW	48'-58' gray-brown, medium to coarse sand with 10-20% large pebble. one discreet zone 1"-3" thick is lighter gray to white and emits a faint fuel odor. Of the 10' section, only recovered ~3'. Thin (0.5 cm) black coal layers intersparsed in section from 1 cm to 10 cm apart
44	204				58'-65' no report
48	200				
52	196				
56	192				
60	188				
64	184				
68					

Well Construction Information

WELL CONSTRUCTION

Date Compl.	: 6/20/99
Hole Diameter	: 8 inch
Filter Pack	: 10-20 Sand
Annulus Seal	: bentonite pellets
Total Depth	: 64.77 feet
Depth to Top of Sand	: 58.75 feet
Depth to Top of Seal	: 55.5 feet
Depth to Water	: 11.88 feet

SURVEY DATA

Datum	: Top of PVC Casing
Datum Elevation	: 250.04
Ground Surface Elev.	: 250.46
Northing	: 596246.02
Easting	: 2604279.54

WELL CASING

Material	: SCH. 40 PVC
Diameter	: 2 inch
Joints	: threaded
Length (feet)	: 60

WELL SCREEN

Material	: SCH. 40 PVC
Diameter	: 2 inch
Joints	: threaded
Slot Size	: 0.010 inch
Length	: 5 feet

NOTES

Well is flush mount constructed

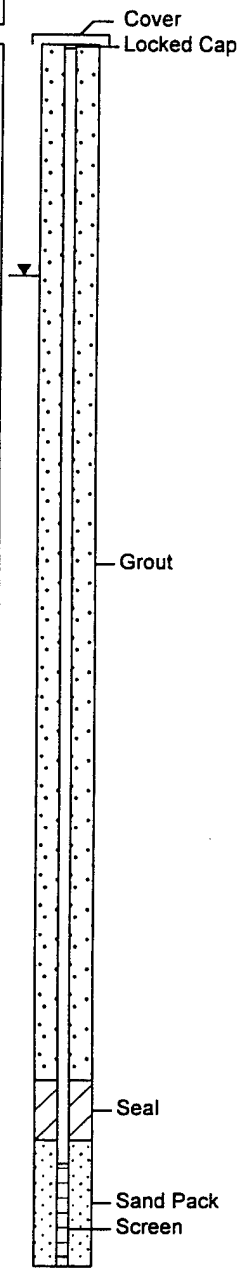
Depth to water measured on 6/23/99

Well depth and depth to water were measured from datum

PID measurements were not made below 25' at this location

SAA = Same as above

Well: MW015D
Elev.: 250.46



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LOG OF BORING 074-TW012

Risk-Based Approach to Remediation
Former Military Gas Station
Eaker AFB, Arkansas

Drilling Company	: Tri-State	Date Spud	: 6/18/99
Rig Type	: CME-55	Date Completed	: 6/18/99
Drilling Method	: Hollow Stem Auger	Weather	: Sunny, upper 70's
Borehole Diameter	: 8 inch	Geologist	: John P. Tunks

Depth in feet	PID (ppm)	GRAPHIC	USCS	DESCRIPTION
0				
	0.6		ML	0-2' light brown, dry, silt with pebble to cobble size gravel, little sand and clay
2			ML	2'-3' dark brown, dry, clayey silt
4	-0.7		CL	3'-12' brown, silty clay with orange staining, dry to damp from 3' -7', damp to moist from 7' - 12'. A 2"-3" layer at 8' has some medium sand
6				
8				
10	0.3			
12			CL	12'-15' gray, moist, clay with little orange staining predominantly in the verticle direction
14				
16	-0.3		CL	15'-24.5' dark blue-gray, damp, clay with intermittent white coarse sand sized staining
18				
20	-1.0			
22				
24	-1.0			
			CL	24.5'-26' Same as above but moist
26				

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LOG OF BORING 074-TW013

Risk-Based Approach to Remediation
Former Military Gas Station
Eaker AFB, Arkansas

Drilling Company	: Tri-State	Date Spud	: 6/18/99
Rig Type	: CME-55	Date Completed	: 6/18/99
Drilling Method	: Hollow Stem Auger	Weather	: Sunny, mid 80's
Borehole Diameter	: 8 inch	Geologist	: John P. Tunks

Depth in feet	PID (ppm)	GRAPHIC	USCS	DESCRIPTION
0				
	-0.9		ML	0-2' brown, dry, silt with pebble to cobble, sand and clay. Fill
2			ML	2'-4' dark brown damp silt with some clay and little cobbles
4	-0.8		ML	4'-5.5' medium brown, damp, clayey silt
6				5.5'-8' no recovery. Hit concrete at 5.5' which blocked spit-spoon
8			CL	8'-12' brown, moist, silty clay with frequent horizontal orange staining
10	-0.9			
12			CL	12'-16' blue-gray, damp, clay, with some orange staining
14				
16	-1.2		CL	16'-23' same as above but dark blue-gray
18				
20	-0.9			
22				
24	-0.6		CL	23'-27' same as above but no orange staining. Coarse sand sized white staining and moist
26				
28				

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LOG OF BORING 074-TW014

Risk-Based Approach to Remediation
Former Military Gas Station
Eaker AFB, Arkansas

Drilling Company	: Tri-State	Date Spud	: 6/19/99
Rig Type	: CME-55	Date Completed	: 6/19/99
Drilling Method	: Hollow Stem Auger	Weather	: Cloudy, mid 70's
Borehole Diameter	: 8 inch	Geologist	: John P. Tunks

Depth in feet	PID (ppm)	GRAPHIC	USCS	DESCRIPTION
0			ML	0-0.5' brown, dry, silt
2	-0.6		ML	0.5' - 2.5' light to medium brown, silt with little organic material (roots), some pebbles to cobbles, some sand and clay
4	-1.3		ML	2.5'-10.5' orange-brown, damp to moist, sandy silt with little clay. A wet layer at 5.5'-6.5'
6				
8				
10	-0.9		CL	10.5'-13' gray, damp, clay with some orange staining
12				
14	-0.9		CL	13'-19.5' same as above, orange staining appears to be around orgainc material (stems, etc.)
16				
18				
20	-1.5		CL	19.5'-26.0' dark blue-gray, damp to moist, clay with little (<10%) white coarse grained sand sized staining
22				
24	-0.7			
26			CL	26'-26.5' same as above but with some medium sand
			SP	26.5'-27' gray, moist, clayey medium sand with some orange staining
28				

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LOG OF BORING 074-TW016

Risk-Based Approach to Remediation
Former Military Gas Station
Eaker AFB, Arkansas

Drilling Company	: Tri-State	Date Spud	: 6/21/99
Rig Type	: CME-55	Date Completed	: 6/21/99
Drilling Method	: Hollow Stem Auger	Weather	: Sunny, upper 70's
Borehole Diameter	: 8 inch	Geologist	: John P. Tunks

Depth in feet	GRAPHIC	USCS	DESCRIPTION
0		ML	0-0.5' brown, dry, slit with some roots, no odor
		ML	0.5'-1.5' brown, damp, sandy silt, no odor
2		SP	1.5'-2.5' yellow, damp, fine to very fine sand with little clay
		ML	2.5'-3' dark brown, moist, clayey silt. no odor
4			3'-13' light brown, moist to wet, silt and clay with some sand. no odor. occasional orange staining
6			
8		CL	
10			
12			
14			13'-19.5 gray, moist, clay with orange staining, no odor
16		CL	
18			
20			19.5-28.8 dark blue-gray, moist to damp, clay with little coarse sand sized white staining
22			
24		CL	
26			
28			28.5 -- No recovery. presumed to be sand
30			
32			
34			
36			
38			

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LOG OF BORING 074-MW013

Risk-Based Approach to Remediation
Former Military Gas Station
Eaker AFB, Arkansas

Drilling Company	: Tri-State	Date Spud	: 6/15/99
Rig Type	: CME-55	Date Completed	: 6/16/99
Drilling Method	: Hollow Stem Auger	Weather	: Sunny, 80's
Borehole Diameter	: 8 inch	Geologist	: John P. Tunks

Depth in feet	Surf. Elev. 248.96	PID (ppm)	GRAPHIC	USCS	DESCRIPTION
0	248	0.6		FL	0-2' Fill material, little gravel, some sand, silt, and organic material
2	246			ML	2'-3 ' brown, damp, clayey silt
4	244	-0.6		CL	3'-5' brown to orange, moist, clay
6	242	0.3		CL	5'-12' SAA, no odor
8	240				
10	238				
12	236	0.3		CL	12'-16' gray, moist, clay, no odor, some orange clay
14	234				
16	232	-0.3		CL	16'-23' gray, moist, clay with trace of small (1mm diameter) white nodules
18	230				
20	228				
22	226	0.9			
24	224	0.0		CL	23'-27' SAA
26	222				
28	220	0.6		SW	27'-28' gray, wet, sand with little clay
30	218	0.6		SW	28'-33' gray, wet, rounded fine to medium sand grading to brown medium rounded sand
32	216				
34					

Well Construction Information

WELL CONSTRUCTION

Date Compl.	: 6/16/99
Hole Diameter	: 8 inch
Filter Pack	: 10-20 Sand
Annulus Seal	: bentonite pellets
Total Depth	: 32.59 feet
Depth to Top of Sand	: 26.9 feet
Depth to Top of Seal	: 24.6 feet
Depth to Water	: 10.44 feet

SURVEY DATA

Datum	: Top of PVC Casing
Datum Elevation	: 248.75
Ground Surface Elev.	: 248.96
Northing	: 596272.00
Easting	: 2604414.77

WELL CASING

Material	: SCH. 40 PVC
Diameter	: 2 inch
Joints	: threaded
Length (feet)	: 27.5 feet

WELL SCREEN

Material	: SCH. 40 PVC
Diameter	: 2 inch
Joints	: threaded
Slot Size	: 0.010 inch
Length	: 5 feet

NOTES

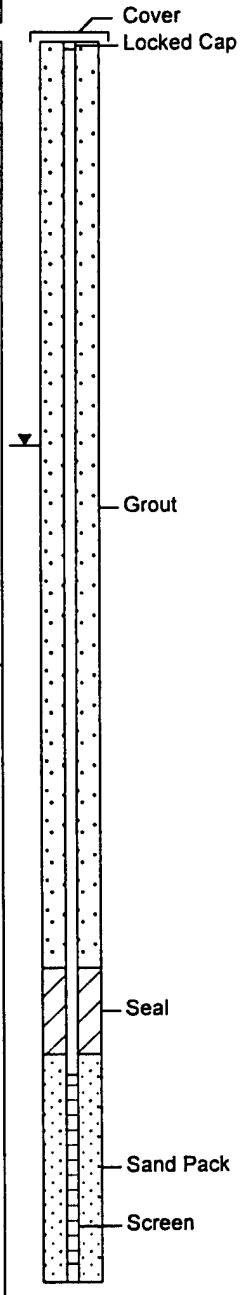
Well is flush mount constructed

Depth to water measured on 6/23/99

Well depth and depth to water water were measured from datum

SAA = Same as above

Well: MW013
Elev.: 248.96



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LOG OF BORING 074-MW014

Risk-Based Approach to Remediation
Former Military Gas Station
Eaker AFB, Arkansas

Drilling Company	: Tri-State	Date Spud	: 6/15/99
Rig Type	: CME-55	Date Completed	: 6/16/99
Drilling Method	: Hollow Stem Auger	Weather	: Sunny, mid 80's
Borehole Diameter	: 8 inch	Geologist	: John P. Tunks

Depth in feet	Surf. Elev. 249.65	PID (ppm)	GRAPHIC	USCS	DESCRIPTION
0				GP	0-0.5' gravel
				CL	0.5'-1.0' sandy clay
2	248	-0.3		CL	1'-3' dark brown, damp, silty clay
4	246				3'-8' orange-brown, moist, clay
6	244	0.0		CL	
8	242			CL	8'-9.5' SAA
10	240			SP	9.5'-9.6' red-orange, wet, sand
		2.7		CL	9.6'-12.5' orange-brown, moist, clay with little silt
12	238				
14	236				12.5'-18' dark blue-gray, moist to wet, clay, some orange staining, 1" sand lense at approx 16', wet
16	234	2.7		CL	
18	232				
20	230	1.3		SP	18'-21.5' gray-brown, medium wet, sand with some orange staining at 21', Intermexed with some clay lenses
22	228			CL	21.5'-23' same as 12.5'-18'
24	226			CL	23'-25' SAA
26	224	2.4		SP	25'-25.5' Grayish brown, medium wet, sand, overlain by 1" layer of black silty sand
				CL	
28	222			CL	25.5'-26.5' Same as 12.5'-18'
					26.5'-28' gray, clay with orange staining
30	220				28'-34' brown, wet, sand, medium tight with brown/orange clay lens at 28.5' to 29' and 30.5' to 31.5', Also a coarse sand lens from 31.5' to 32. Black granular 0.5" layer at 28.5' with a 1" diameter flat coal particle
32	218	2.7		SP	
34	216				

Well Construction Information

WELL CONSTRUCTION

Date Compl.	: 6/16/99
Hole Diameter	: 8 inch
Filter Pack	: 10-20 Sand
Annulus Seal	: bentonite pellets
Total Depth	: 34.25 feet
Depth to top of sand	: 27.5 feet
Depth to top of seal	: 25.5 feet
Depth to water	: 11.11 feet

SURVEY DATA

Datum	: Top of PVC Casing
Datum Elevation	: 249.50
Ground Surface Elev.	: 249.65
Northing	: 596375.17
Easting	: 2604474.94

WELL CASING

Material	: SCH. 40 PVC
Diameter	: 2 inch
Joints	: threaded
Length (feet)	: 29

WELL SCREEN

Material	: SCH. 40 PVC
Diameter	: 2 inch
Joints	: threaded
Slot Size	: 0.010 inch
Length	: 5 feet

NOTES

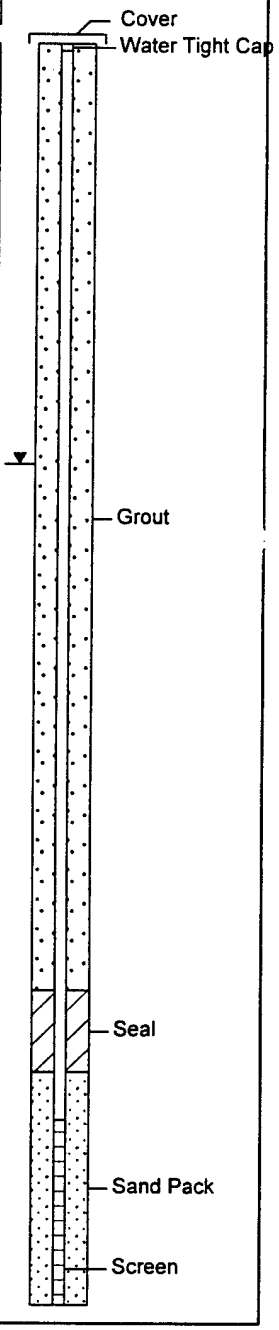
Well is flush mount constructed

Depth to water measured on 6/22/99

Well depth and depth to water were measured from datum

SAA = Same as above

Well: MW014
Elev.: 249.65



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LOG OF BORING 074-MW015I

Risk-Based Approach to Remediation
Former Military Gas Station
Eaker AFB, Arkansas

Drilling Company	: Tri-State	Date Spud	: 6/19/99
Rig Type	: CME-55	Date Completed	: 6/20/99
Drilling Method	: Hollow Stem Auger	Weather	: Overcast, upper 80's
Borehole Diameter	: 8 inch	Geologist	: John P. Tunks

Depth in feet	Surf. Elev. 250.34	PID (ppm)	GRAPHIC	USCS	DESCRIPTION
0	250	0.0		ML	0-1.5' medium brown, dry, silt with little clay, sand and cobbles
2	248			ML	1.5'-3' dark brown, dry, silt with some clay
4	246	-0.6		ML	3'-9.5' orange-brown, damp to moist, silt with some clay, becoming more moist with depth
6	244				
8	242				
10	240	-0.3		ML	9.5'-12' SAA but wet and increasing in clay content
12	238			CL	12'-18' gray-brown, moist, clay with orange staining
14	236	-0.8			
16	234				
18	232			CL	18'-25' Dark blue gray, moist to wet, clay
20	230	-0.6			
22	228				
24	226	-0.4			
26	224			CL	25'-28' gray, moist to wet, clay with some medium sand between 27' and 28'
28	222			SP	28'-33' medium gray-brown, wet, sand with trace to little gray clay
30	220				
32	218				33'-38' No recovery
34	216				
36	214				
38	212				38'-43' No recovery exect 1"-2" layer of black coal. Cutting forced out of top of auger consist of 90% medium sands and 10% black coal, small cobbles-pebbles
40	210				
42	208				
44	206				43'-45.5' No recovery
46					

Well Construction Information

WELL CONSTRUCTION

Date Compl.	: 6/20/99
Hole Diameter	: 8 inch
Filter Pack	: 10-20 Sand
Annulus Seal	: bentonite pellets
Total Depth	: 44.35 feet
Depth to Top of Sand	: 38.8 feet
Depth to Top of Seal	: 36.8 feet
Depth to Water	: 11.64 feet

SURVEY DATA

Datum	: Top of PVC Casing
Datum Elevation	: 249.77
Ground Surface Elev.	: 250.34
Northing	: 596245.12
Easting	: 2604283.61

WELL CASING

Material	: SCH. 40 PVC
Diameter	: 2 inch
Joints	: threaded
Length (feet)	: 40

WELL SCREEN

Material	: SCH. 40 PVC
Diameter	: 2 inch
Joints	: threaded
Slot Size	: 0.010 inch
Length	: 5 feet

NOTES

Well is flush mount constructed

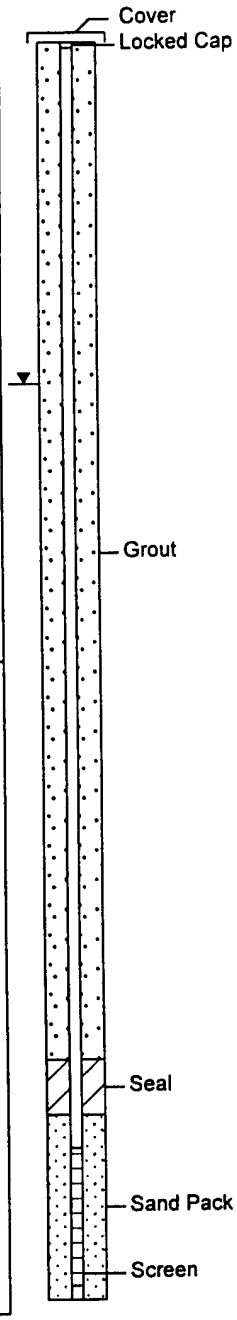
Depth to water measured on 6/23/99

Well depth and depth to water were measured from datum

PID measurements were not made below 25 feet

SAA = Same as above

Well: MW015I
Elev.: 250.34



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LOG OF BORING 074-MW016

Risk-Based Approach to Remediation
Former Military Gas Station
Eaker AFB, Arkansas

Drilling Company	: Tri-State	Date Spud	: 6/23/99
Rig Type	: CME-55	Date Completed	: 6/23/99
Drilling Method	: Hollow Stem Auger	Weather	: Overcast, mid 70's
Borehole Diameter	: 8 inch	Geologist	: John P. Tunks

Depth in feet	Surf. Elev. 250.51	USCS	PID (ppm)	DESCRIPTION
0	250	ML	0.0	0-1.5' Cobbly Sandy silt with some clay and roots. Dry
				1.5'-8' Dark Brown damp to moist silty clay with some orange staining
5	245	CL	-0.3	
				8'-15' yellowish brown, silty clay, moist, orange horizontal staing and some vertical root casts
10	240	CL	-0.7	
15	235	CL	-0.5	15'-19.5' blue gray, moist, clay with orange staining along verticle root casts and other orgainc material
20	230	CL	-0.8	19.5'-24.5' dark blue gray, moist, clay with trace of orange staining
25	225	CL	-0.8	24.5'-27.8' Gray, moist to wet, Sandy Clay
		SW		27.8'-28' light brown, wet, medium to coarse sand
				28'-33' gray, wet, sandy clay
30	220	SW	-0.6	28'-33' approx. 3 feet of recovery; brown gray, wet, medium/coarse sand with thin (0.5 inch) black coal layers
				33'-35' no recovery
35				

Well Construction Information

WELL CONSTRUCTION

Date Compl.	: 6/23/99
Hole Diameter	: 8 inch
Filter Pack	: 10-20 Sand
Annulus Seal	: bentonite pellets
Total Depth	: 34.80 feet
Depth to top of sand	: 28.5 feet
Depth to top of seal	: 26.2 feet
Depth to water	: 11.37 feet

SURVEY DATA

Datum	: Top of PVC Casing
Datum Elevation	: 249.89
Ground Surface Elev.	: 250.51
Northing	: 596290.26
Easting	: 2604708.28

WELL CASING

Material	: SCH. 40 PVC
Diameter	: 2 inch
Joints	: threaded
Length (feet)	: 30 feet

WELL SCREEN

Material	: SCH. 40 PVC
Diameter	: 2 inch
Joints	: threaded
Slot Size	: 0.010 inch
Length	: 5 feet

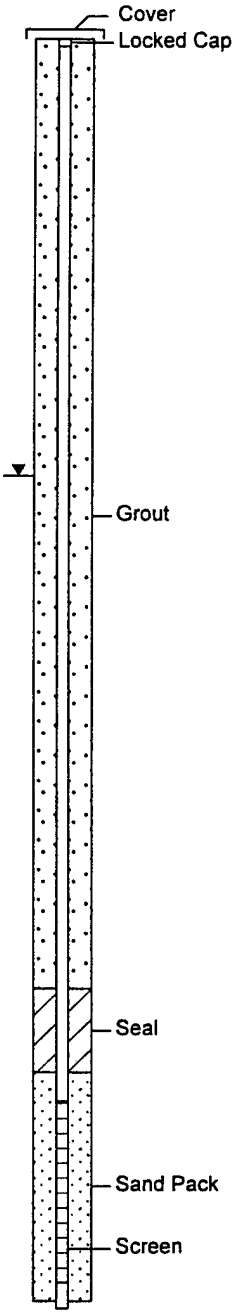
NOTES

Well is flush mount constructed

Depth to water measured on 6/24/99

Well depth and depth to water were measured from datum

Well: MW016
Elev.: 250.51



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LOG OF BORING 074-MW017

Risk-Based Approach to Remediation
Former Military Gas Station
Eaker AFB, Arkansas

Drilling Company	: Tri-State	Date Spud	: 6/24/99
Rig Type	: CME-55	Date Completed	: 6/24/99
Drilling Method	: Hollow Stem Auger	Weather	: NA
Borehole Diameter	: 8 inch	Geologist	: John P. Tunks

Well: MW017
Elev.: 248.73

Depth in feet	Surf. Elev. 248.73
0	248
2	246
4	244
6	242
8	240
10	238
12	236
14	234
16	232
18	230
20	228
22	226
24	224
26	222
28	220
30	218
32	216
34	214
36	212
38	210
40	208
42	206
44	204
46	202
48	200
50	198
52	

Well Construction Information

WELL CONSTRUCTION

Date Compl.	: 6/24/99
Hole Diameter	: 8 inch
Filter Pack	: 10-20 Sand
Annulus Seal	: bentonite pellets
Total Depth	: 49.72 feet
Depth to Top of Sand	: 38.2 feet
Depth to Top of Seal	: 35.5 feet
Depth to Water	: 10.59 feet

SURVEY DATA

Datum	: Top of PVC Casing
Datum Elevation	: 248.41
Ground Surface Elev.	: 248.73
Northing	: 596161.51
Easting	: 2603871.24

WELL CASING

Material	: SCH. 40 PVC
Diameter	: 2 inch
Joints	: threaded
Length (feet)	: 40

WELL SCREEN

Material	: SCH. 40 PVC
Diameter	: 2 inch
Joints	: threaded
Slot Size	: 0.010 inch
Length	: 10 feet

NOTES

Well is flush mount constructed

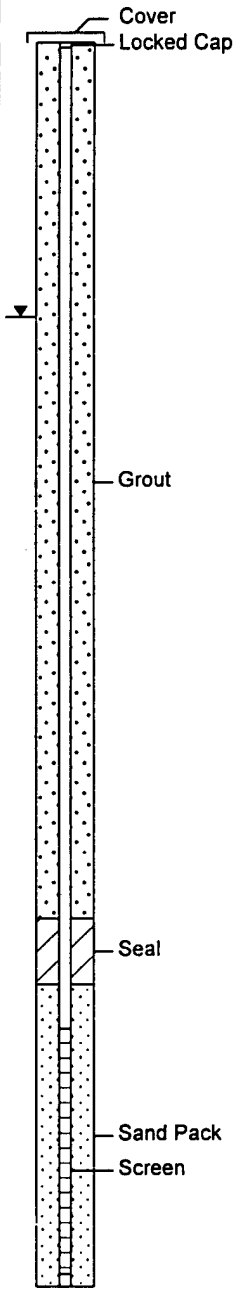
Depth to water measured on 6/25/99

Well depth and depth to water were measured from datum

NA = Not Available

Log of Boring was not completed at this location

PID measurements were not made at this location



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LOG OF BORING 074-MW018

Risk-Based Approach to Remediation
Former Military Gas Station
Eaker AFB, Arkansas

Drilling Company	: Tri-State	Date Spud	: 6/24/99
Rig Type	: CME-55	Date Completed	: 6/24/99
Drilling Method	: Hollow Stem Auger	Weather	: NA
Borehole Diameter	: 8 inch	Geologist	: John P. Tunks

Well: MW018
Elev.: 250.55

Depth in feet | Surf. Elev. 250.55

Well Construction Information

WELL CONSTRUCTION

Date Compl.	: 6/24/99
Hole Diameter	: 8 inch
Filter Pack	: 10-20 Sand
Annulus Seal	: bentonite pellets
Total Depth	: 44.80 feet
Depth to Top of Sand	: 38.2 feet
Depth to Top of Seal	: 35.4 feet
Depth to Water	: 11.91 feet

SURVEY DATA

Datum	: Top of PVC Casing
Datum Elevation	: 250.38
Ground Surface Elev.	: 250.55
Northing	: 596451.84
Easting	: 2604753.19

WELL CASING

Material	: SCH. 40 PVC
Diameter	: 2 inch
Joints	: threaded
Length (feet)	: 40

WELL SCREEN

Material	: SCH. 40 PVC
Diameter	: 2 inch
Joints	: threaded
Slot Size	: 0.010 inch
Length	: 5 feet

NOTES

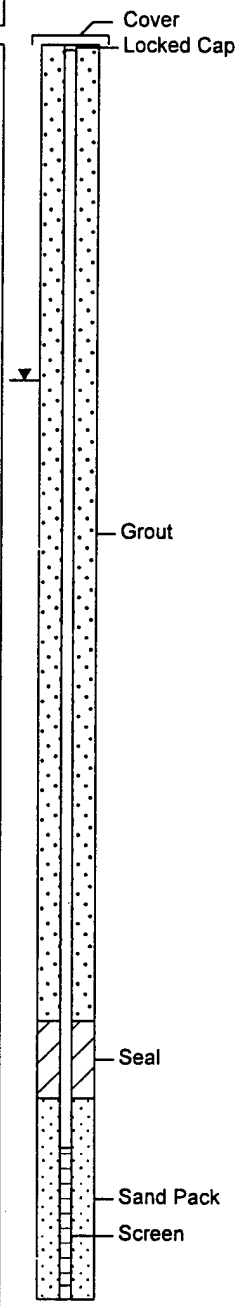
Well is flush mount constructed

Depth to water measured on 6/25/99

Well depth and depth to water were measured from datum

Log of Boring was not completed at this location

PID measurements were not made at this location



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MONITORING WELL DEVELOPMENT FORMS: PHASE III

MONITORING WELL DEVELOPMENT RECORD

Well Identification MW 013
Job Number: 734786.03000
Location Eaker AFB - Former Military Gas Station

Job Name: AFCEE-RNA
by JBB Date: 6/23

Measurement Datum T.O.C.

Pre-Development Information

Time (Start): 0950 (water level, set up)
1729 - started pumping.

Water Level: 10.44
No free product.

Total Depth of Well: 32.59

Water Characteristics

Color Brown Clear (Cloudy)
Odor: None Weak Moderate (Strong)
Any Films or Immiscible Material Yes - no color.
pH 6.67 Temperature (°C) 19.6
Specific Conductance (µS/cm) 440.4
Dissolved Oxygen (mg/L) 0.21
Redox (mV) -35.1

Interim Water Characteristics

Casing Vol = 3.61 gal
10 X = 36.1 gal

Gallons Removed 25

pH 6.64

Temperature (°C) 19.7

Specific Conductance(µS/cm) 470

Dissolved Oxygen (mg/L) ~~0.36~~ 0.24

Redox (mV) -1.4

Post-Development Information

Time (Finish): 1800

Water Level:

Total Depth of Well:

Approximate Volume Removed: 45 gal.

Water Characteristics

Color Slightly brown Clear (Cloudy)
Odor: None Weak Moderate (Strong)
Any Films or Immiscible Material YES - Film on surface of Drum, no color.
pH 6.55 Temperature (°C) 19.6
Specific Conductance (µS/cm) 515
Dissolved Oxygen (mg/L) 0.27
Redox (mV) -48.2

Comments:

MONITORING WELL DEVELOPMENT RECORD

An Additional 50gal Purged on 6/23/99 by JBR.

Well Identification MW014
Job Number: 734786.03000 Job Name: AFCEE-RNA
Location Eaker AFB - Former Military Gas Station by JBB Date: 6/22/99

Measurement Datum Top of PVC casing / black mark ~~on the~~ on PVC.

Pre-Development Information Time (Start): 17:48

Water Level: 11.11 ft below T.O.C. Total Depth of Well: 34.25'

Water Characteristics

Color Light to Dark brown Clear (Cloudy)
Odor: None (Weak) Moderate Strong menthol odor
Time 18:57 Any Films or Immiscible Material
pH 6.58 Temperature (°C) 19.8
Specific Conductance (µS/cm) 726
Dissolved Oxygen (mg/L) 0.07
Redox (mV) 181.3

Interim Water Characteristics

Gallons Removed ~20
pH 6.60 S.U.
Temperature (°C) 19.6
Specific Conductance(µS/cm) 488
Dissolved Oxygen (mg/L) 0.15
Redox (mV) 35.0

~~17:55~~ Purge Rate 5gal / 4 min
16:07 5gal 3.5 min

18:08 - well surged A few times by letting water flow back down tubing into well

Post-Development Information Time (Finish): 18:35

Water Level: 11.11 Total Depth of Well: 34.25'

Approximate Volume Removed: 45

Water Characteristics

Color Slightly brown Clear Cloudy
Odor: (None) Weak Moderate Strong
Any Films or Immiscible Material none
pH 6.60 Temperature (°C) 19.9
Specific Conductance (µS/cm) 467
Dissolved Oxygen (mg/L) 0.15
Redox (mV) -8.8

18:24 50 gal Drum Filled ~ 4" From top.

Comments:

New pH probe used for 1st time here. calibrated to 4.00 and 7.00.
D.O. Zero = 0.03 mg/L.
Redox checked w/ YSI Scott 3682 solution / temp = 21.3°C / at 30°C Reading for Std = 224.5
Meter Reads 1.

MONITORING WELL DEVELOPMENT RECORD

Well Identification MW 15 I
Job Number: 734786.03000
Location Eaker AFB - Former Military Gas Station

Job Name: AFCEE-RNA
by JBB Date: 6/23

Measurement Datum Top of PVC casing, mark at North.

Pre-Development Information

Time (Start): 13:59

Water Level: 11.64

Total Depth of Well: 44.35'

Water Characteristics

Color Very Cloudy Brown Clear (Cloudy)
Odor: None Weak Moderate Strong
Any Films or Immiscible Material Possible Sheen.
pH _____ Temperature (°C) 19.6
Specific Conductance (µS/cm) 563
Dissolved Oxygen (mg/L) 0.46
Redox (mV) ~~234~~ 0.9

Interim Water Characteristics

Casing V = 5.34 gal
10 V = 53.4 gal.

14:35 Gallons Removed _____

pH ~~6.10~~ 6.57

Temperature (°C) 19.6

Specific Conductance(µS/cm) 564

Dissolved Oxygen (mg/L) 0.19

Redox (mV) -35.7

1 gal / 47 sec.

Post-Development Information

Time (Finish): _____

Water Level: 11.69

Total Depth of Well: _____

Approximate Volume Removed: 80 gal

Water Characteristics

Color Slightly Milky Clear (Cloudy)
Odor: None Weak Moderate (Strong)
Any Films or Immiscible Material Yes, (no color)
pH 6.68 Temperature (°C) 19.7
Specific Conductance (µS/cm) 591
Dissolved Oxygen (mg/L) 0.30
Redox (mV) -251.6

Comments:

MONITORING WELL DEVELOPMENT RECORD

Well Identification MW 15D
Job Number: 734786.03000 Job Name: AFCEE-RNA
Location Eaker AFB - Former Military Gas Station by JBB Date: 6/23

Measurement Datum TOP OF PVC. casing North Mark

Pre-Development Information Time (Start): 13.59

Water Level: 11.88 Total Depth of Well: 64.77

Water Characteristics

Color slightly cloudy Clear (Cloudy)
Odor: None Weak (Moderate) Strong
Any Films or Immiscible Material none
pH 6.76 Temperature (°C) 17.8
Specific Conductance (µS/cm) 455
Dissolved Oxygen (mg/L) 0.21
Redox (mV) +77.3

Interim Water Characteristics

Casing V = 8.63
10 x V = 86.3

14:44 Gallons Removed

pH 6.94

Temperature (°C) 19.6

Specific Conductance(µS/cm) 429.7

Dissolved Oxygen (mg/L) 0.47

Redox (mV) -14.7

Post-Development Information Time (Finish): 15:30

Water Level: 11.89 Total Depth of Well:

Approximate Volume Removed: 90 gal.

Water Characteristics

Color clear. (Clear) Cloudy
Odor: None Weak (Moderate) Strong
Any Films or Immiscible Material slight film - no color.
pH 6.93 Temperature (°C) 19.8
Specific Conductance (µS/cm) 422
Dissolved Oxygen (mg/L) 0.23
Redox (mV) -31.6

Comments:

well pressurized when cap was initially removed.

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MONITORING WELL DEVELOPMENT RECORD

Well Identification MW016
Job Number: 734786.03000
Location Eaker AFB - Former Military Gas Station

Job Name: AFCEE-RNA
by JPT Date: 6/24/99

Measurement Datum _____

Pre-Development Information

Time (Start): 1845

Water Level: 11.37' from TOC

Total Depth of Well: 34.80' from TOC

Water Characteristics

Color Brownish Clear (Cloudy)
Odor: (None) Weak Moderate Strong
Any Films or Immiscible Material none
pH 7.21 Temperature (°C) 20.6
Specific Conductance (µS/cm) 203.5
Dissolved Oxygen (mg/L) 0.72
Redox (mV) -1.7mV

Interim Water Characteristics

Gallons Removed approx. 52

pH 6.40

Temperature (°C) 20.0

Specific Conductance(µS/cm) 283.5

Dissolved Oxygen (mg/L) 0.52

Redox (mV) 42.8

Post-Development Information

Time (Finish): 1955

Water Level: _____

Total Depth of Well: 34.80'

Approximate Volume Removed: approx 105 gal

Water Characteristics

Color ~~clr~~ none (Clear) Cloudy
Odor: (None) Weak Moderate Strong
Any Films or Immiscible Material none
pH 6.39 Temperature (°C) 19.9
Specific Conductance (µS/cm) 297.6
Dissolved Oxygen (mg/L) 0.33
Redox (mV) 42.7

Comments:

MONITORING WELL DEVELOPMENT RECORD

Well Identification MW017
Job Number: 734786.03000 Job Name: AFCEE-RNA
Location Eaker AFB - Former Military Gas Station by JBB, JPT Date: 6/25/99

Measurement Datum TOP OF PVC Casing, Marked at North.

Pre-Development Information Time (Start):

Water Level: 10.59 ft btoc Total Depth of Well: 49.72 ft btoc.

Water Characteristics

Color brownish Clear (Cloudy)
Odor: None Weak Moderate Strong
Any Films or Immiscible Material No
pH 6.76. Temperature (°C) 19.1
Specific Conductance (µS/cm) 255.0
Dissolved Oxygen (mg/L) 0.32
Redox (mV) 50.3

Interim Water Characteristics

Casing Vol = 6.39 gal.
10 V = 64 gal

Gallons Removed 65 gal. —
pH 6.42
Temperature (°C) 18.6
Specific Conductance(µS/cm) 211.2
Dissolved Oxygen (mg/L) 0.40.
Redox (mV) 74.7
Still very turbid.

Post-Development Information Time (Finish): ~~0~~ 21:10.

Water Level: Total Depth of Well:

Approximate Volume Removed: 95

Water Characteristics

Color slightly white turbidity. Clear (Cloudy)
Odor: ~~None~~ Weak Moderate Strong
Any Films or Immiscible Material no.
pH 6.57 Temperature (°C) 18.2
Specific Conductance (µS/cm) 243.2
Dissolved Oxygen (mg/L) 0.25
Redox (mV) 107.4

Comments:

MONITORING WELL DEVELOPMENT RECORD

Well Identification 074 - MW018
Job Number: 734786.03000 Job Name: AFCEE-RNA
Location Eaker AFB - Former Military Gas Station by JBB Date: 6/25/99

Measurement Datum T.O.C, black mk. at North.

Pre-Development Information Time (Start): 1727

Water Level: 11.91 Total Depth of Well: 44.80

Water Characteristics

Color Light brown. Clear (Cloudy)
Odor: (None) Weak Moderate Strong
Any Films or Immiscible Material none.
pH 6.76 Temperature (°C) 22.2
Specific Conductance (µS/cm) 409.6
Dissolved Oxygen (mg/L) 0.27
Redox (mV) +129.4

Interim Water Characteristics

Casing Vol = 5.37 gal.
10 = 54 gal.

Gallons Removed 25
pH 6.77
Temperature (°C) 19.8
Specific Conductance(µS/cm) ~~0.21~~ 383.6
Dissolved Oxygen (mg/L) 0.21
Redox (mV) +47.6

Post-Development Information Time (Finish):

Water Level: Total Depth of Well: 44.80

Approximate Volume Removed: 85 gal.

Water Characteristics

Color Clear Cloudy
Odor: None Weak Moderate Strong
Any Films or Immiscible Material
pH 6.57 Temperature (°C) 19.8
Specific Conductance (µS/cm) 387.3
Dissolved Oxygen (mg/L) 0.25
Redox (mV) -31.2

Comments:

SAMPLE COLLECTION FORMS: PHASE III

GROUNDWATER SAMPLING RECORD

MONITORING WELL ID: MW-03

SAMPLING LOCATION: Eaker AFB - Former Military Gas Station (Job#: 734786.03000)

DATE AND TIME OF SAMPLING: 6/24/99, 1999 _____ a.m./p.m.

SAMPLE COLLECTED BY: : N/A of Parsons ES

WEATHER: 80°F, clear, calm winds.

1. [ ] MONITORING WELL CONDITION:

[X] Locked [ ] Unlocked

Well Number: [X] Is Apparent [ ] Is Not Apparent. Explain: _____

Steel Casing Condition Is: good

Inner PVC Condition Is: good

[ ] Deficiencies Corrected By Sample Collector

[ ] Monitoring Well Required Repair (Describe): N/A

2. [ ] PRODUCT INFORMATION:

[ ] Product Observed At Depth Of N/M Feet Below Datum With _____

[ ] Product Not Observed

3. [ ] WATER LEVEL:

[ ] Water Depth Measured At N/M Feet Below Datum _____ With _____

[ ] Other. Explain: _____

4. [ ] MONITORING WELL EVACUATION:

Method: Peristaltic pump (groPump 2), dedicated tubing

Other, Describe: _____

5. [X] ON-SITE MEASUREMENTS:

[X] DIRECT INSTRUMENT READINGS

Time 0912.	0914	0930	0935	0950	0935	0940	0945 Measured With	0950
Temp (°C)	NM							
pH	NM							
Cond (µS/cm)	NM						0.21	0.24
Do (mg/L)	0.87	0.50	0.39	0.33	0.28	0.24	93I-85	
Redox (mv)	NM							
gallons purged	~500mL		1.5gal		2			3

Additional Comments: Well purged to measure DO.

[ ] FIELD CHEMISTRY RESULTS (See "Field Chemistry" Item #9)

[X] NOT PERFORMED, EXPLAIN: DO. only measurement done.

6. [ ] MONITORING WELL EVACUATION OBSERVATIONS:

Final Water Level: _____ Feet Below Datum N/M

Final Observations: Water (slightly - very) cloudy clear

Water level (rose - fell - no change)

Volume Removed: _____

Water odors/comments: strong fuel odor

Other Comments: TSI-85 checked for D.O. Zero = 0.01 mg/L.

Groundwater Sampling Record

MONITORING WELL No. _____ (Cont'd)

7. [ ] SAMPLE CONTAINERS:

TIME SAMPLE COLLECTED: _____ **DATE SAMPLE COLLECTED:** _____

DUPLICATE COLLECTED: YES/NO

DUPLICATE ID: _____ DUPLICATE SAMPLE TIME: _____

Quantity	Container Size	Container Type	Analysis	Preservative Type Field/Lab	Filter Y/N
		N/A			

Sample Extraction Method: _____

8. [ ] CONTAINER HANDLING:

[ ] Container Sides Labeled

[ ] Container Lids Taped

[ ] Containers Placed in Ice Chest

9. [ ] FIELD CHEMISTRY RESULTS

Analyte	Dilution?	Concentration	Observations/Notes
(1) Sulfate			
(2) Ferrous Iron			
(3) Manganese			
(4) Carbon Dioxide			
(5) Alkalinity			
(6) Chloride			

Additional Comments: _____

OTHER COMMENTS: _____

GROUNDWATER SAMPLING RECORD

MONITORING WELL ID: MW004

SAMPLING LOCATION: Eaker AFB - Former Military Gas Station (Job#: 734786.03000)

DATE AND TIME OF SAMPLING: 6/23/99, 1999 _____ a.m./p.m.

SAMPLE COLLECTED BY: : N/A of Parsons ES

WEATHER: cloudy 85°F

1. [ ] MONITORING WELL CONDITION:

[X] Locked [ ] Unlocked

Well Number: [X] Is Apparent [ ] Is Not Apparent. Explain: _____

Steel Casing Condition Is: _____

Inner PVC Condition Is: Good

[ ] Deficiencies Corrected By Sample Collector

[ ] Monitoring Well Required Repair (Describe): _____

2. [ ] PRODUCT INFORMATION:

[ ] Product Observed At Depth Of NM Feet Below Datum With _____

[ ] Product Not Observed

3. [ ] WATER LEVEL:

[ ] Water Depth Measured At NM Feet Below Datum _____ With _____

[ ] Other. Explain: _____

4. [ ] MONITORING WELL EVACUATION:

Method: Peristaltic Pump, Dedicated tubing.

Other, Describe: _____

5. [ ] ON-SITE MEASUREMENTS:

[ ] DIRECT INSTRUMENT READINGS

Time 19:38	19:39	1944	19:49	19:54	18:01		Measured With
Temp (°C)	NM	→	→	→	→		/
pH	NM	→	→	→	→		/
Cond (µS/cm)	NM	→	→	→	→		/
Do (mg/L)	0.58	0.30	0.23	0.21	0.23		YSI-85
Redox (mv)	NM	→	→	→	→		/
gallons purged	500mL	~0.25			~2.5 gal		5 gal bucket

Additional Comments: _____

[ ] FIELD CHEMISTRY RESULTS (See "Field Chemistry" Item #9)

[X] NOT PERFORMED, EXPLAIN: Purged to measure D.O.

6. [ ] MONITORING WELL EVACUATION OBSERVATIONS:

Final Water Level: NM Feet Below Datum _____

Final Observations: Water (slightly - very) cloudy

Water level (rose - (fell) - no change)

Volume Removed: ~2.5

Water odors/comments: strong fuel odor.

Other Comments: _____

Groundwater Sampling Record

MONITORING WELL No. _____ (Cont'd)

7. [ ] **SAMPLE CONTAINERS:**

TIME SAMPLE COLLECTED: N/A **DATE SAMPLE COLLECTED:** _____

DUPLICATE COLLECTED: YES/NO

DUPLICATE ID: _____ DUPLICATE SAMPLE TIME: _____

Quantity	Container Size	Container Type	Analysis	Preservative Type	Preservative Field/Lab	Filter Y/N
		N/A				

Sample Extraction Method: _____

8. [ ] **CONTAINER HANDLING:**

N/A
- [ ] Container Sides Labeled
- [ ] Container Lids Taped
- [ ] Containers Placed in Ice Chest

9. [ ] **FIELD CHEMISTRY RESULTS** N/A

Analyte	Dilution?	Concentration	Observations/Notes
(1) Sulfate			
(2) Ferrous Iron			
(3) Manganese			
(4) Carbon Dioxide			
(5) Alkalinity			
(6) Chloride			

Additional Comments: _____

OTHER COMMENTS: _____

GROUNDWATER SAMPLING RECORD

MONITORING WELL ID: MW12

SAMPLING LOCATION: Eaker AFB - Former Military Gas Station (Job#: 734786.03000)
DATE AND TIME OF SAMPLING: 6/14, 1999 1910 a.m./p.m.
SAMPLE COLLECTED BY: : JPT of Parsons ES
WEATHER: partly cloudy, mid-70's °F.

1. [X] MONITORING WELL CONDITION:

[X] Locked [ ] Unlocked
Well Number: [X] Is Apparent [ ] Is Not Apparent. Explain:
Steel Casing Condition Is: good
Inner PVC Condition Is: good
[ ] Deficiencies Corrected By Sample Collector
[ ] Monitoring Well Required Repair (Describe):

2. [X] PRODUCT INFORMATION:

[X] Product Observed At Depth Of ~~11.00~~ Feet Below Datum With
~~[X]~~ Product Not Observed

3. [X] WATER LEVEL:

[X] Water Depth Measured At ~~11.00~~ 11.01 Feet Below Datum
With oil/water level meter
[ ] Other. Explain:

4. [X] MONITORING WELL EVACUATION:

Method: peristaltic pump
Other, Describe:

5. [ ] ON-SITE MEASUREMENTS:

[ ] DIRECT INSTRUMENT READINGS

Time	1895	1852	1900	1910			Measured With
Temp (°C)	21.0	20.3	19.3	19.2			
pH	6.89	6.93	7.31	7.30			
Cond (µS/cm)	NM	NM	2.5	2.3			
Do (mg/L)	~~0.32~~	0.29	~~0.37~~	0.25			
Redox (mv)	NM	NM	-188	-182			
gallons purged ~	0.33	0.66	1	1.5			

Additional Comments: oily sheen and odor from purge water

[X] FIELD CHEMISTRY RESULTS (See "Field Chemistry" Item #9)
[ ] NOT PERFORMED, EXPLAIN:

6. [ ] MONITORING WELL EVACUATION OBSERVATIONS:

Final Water Level: Feet Below Datum
Final Observations: Water (slightly - very) cloudy
Water level (rose - fell - no change)
Volume Removed: ~2 gal
Water odors/comments: strong fuel odor
Other Comments: oily sheen on surface

Groundwater Sampling Record

MONITORING WELL No. MW12 (Cont'd)

7. [ ] **SAMPLE CONTAINERS:**

TIME SAMPLE COLLECTED: 1910 **DATE SAMPLE COLLECTED:** 6/14/99

DUPLICATE COLLECTED: YES/(NO)

DUPLICATE ID: _____ DUPLICATE SAMPLE TIME: _____

Quantity	Container Size	Container Type	Analysis	Preservative Type	Preservative Field/Lab	Filter Y/N
1	40 mL	Glass	Immunoassay BTEX	None		N

Sample Extraction Method: _____

8. [ ] **CONTAINER HANDLING:**

[ ] Container Sides Labeled

[ ] Container Lids Taped

[X] Containers Placed in Ice Chest

9. [ ] **FIELD CHEMISTRY RESULTS**

Analyte	Dilution?	Concentration	Observations/Notes
(1) Sulfate		~3 µg/L	
(2) Ferrous Iron		5.10 mg/L	
(3) Manganese			
(4) Carbon Dioxide			
(5) Alkalinity			
(6) Chloride			
BTEX via Immunoassay (at 2240, 6/14/99)		>3,000 ppb	

Additional Comments: _____

OTHER COMMENTS: oily sheen and strong fuel odor from purge water

GROUNDWATER SAMPLING RECORD

MONITORING WELL ID: MW 012

SAMPLING LOCATION: Eaker AFB - Former Military Gas Station (Job#: 734786.03000)

DATE AND TIME OF SAMPLING: 6/26/99, 1999 10:20 a.m./p.m.

SAMPLE COLLECTED BY: : JBB, JPT. of Parsons ES

WEATHER: 80°F, cloudy, Humid, Rain Showers.

1. [ ] MONITORING WELL CONDITION:

[X] Locked [ ] Unlocked

Well Number: [X] Is Apparent [ ] Is Not Apparent. Explain: _____

T.D. = 33.0 ft

Steel Casing Condition Is: good

Inner PVC Condition Is: good.

[ ] Deficiencies Corrected By Sample Collector

[ ] Monitoring Well Required Repair (Describe): _____

2. [X] PRODUCT INFORMATION:

[X] Product Observed At Depth Of NM. Feet Below Datum With _____

[ ] Product Not Observed

3. [X] WATER LEVEL:

[X] Water Depth Measured At 11.55 Feet Below Datum T.O.C., North mark.

With Solinst.

[ ] Other. Explain: _____

4. [X] MONITORING WELL EVACUATION:

Method: Peristaltic Pump, dedicated tubing.

Other, Describe: _____

5. [X] ON-SITE MEASUREMENTS:

[ ] DIRECT INSTRUMENT READINGS

Time start 0842	0847	0852	0907	0931	0946	0956	1006 Measured	With
Temp (°C)	19.4	19.2	19.6	19.5	19.4	19.4	19.4	YSI 85
pH	6.82	6.77	6.68	6.66	6.52	6.54	656	ORION 250A
Cond (µS/cm)	873	853	847	945	849	851	852	YSI 85
Do (mg/L)	0.26	0.11	0.14	0.19	0.17	0.18	0.18	YSI 85
Redox (mv)	+237	~~+166~~ 199.0	182.0	236.6	216.0	196.3	246.3	ORION 250A
gallons purged	1.5	2.5	5.5	8.0	10	12	14	5 gal. bucket

Additional Comments: Initial Liter of water Purged was a greenish black color, very silty, ~~strong~~ strong Fuel odor in water. ORP seems high; ORP was checked with YSI Zobell solution at 0915. It seems to be okay.

[X] FIELD CHEMISTRY RESULTS (See "Field Chemistry" Item #9)

[ ] NOT PERFORMED, EXPLAIN: _____

6. [ ] MONITORING WELL EVACUATION OBSERVATIONS:

Final Water Level: _____ Feet Below Datum _____

Final Observations: Water (slightly - very) cloudy

Water level (rose - fell - no change)

Volume Removed: 20 gal

Water odors/comments: V. strong Fuel odor.

Other Comments: _____

Casing V = 3.5 gal

3V = 10.5 gal

Groundwater Sampling Record

MONITORING WELL No. MW012 (Cont'd)

7. [ ] **SAMPLE CONTAINERS:**

TIME SAMPLE COLLECTED: 1020 **DATE SAMPLE COLLECTED:** 6/26/13

DUPLICATE COLLECTED: YES (NO)

DUPLICATE ID: N/A DUPLICATE SAMPLE TIME: N/A

Quantity	Container Size	Container Type	Analysis	Preservative Type ~~Field~~ Lab	Filter Y/N
3	40mL	VOA	~~EPA~~ 8260	HCL	NO
3	40mL	"	RSK 175	HCL	"
total = 6					

Sample Extraction Method: Peristaltic Pump. / Dedicated tubing

8. [ ] **CONTAINER HANDLING:**

- [X] Container Sides Labeled
- [X] Container Lids Taped
- [X] Containers Placed in Ice Chest

9. [ ] **FIELD CHEMISTRY RESULTS**

Analyte	Dilution?	Concentration	Observations/Notes
(1) Sulfate	NO	0.0	no turb.
(2) Ferrous Iron	10mL samp: 50mL total = 4.73 x 5 = 23.65		DARK Rust color
(3) Manganese ~~Dup.~~ Ferrous Iron sulfate.	10mL Samp 60mL total = 4.38 x 6 = 26.28		" " "
~~(4) Carbon Dioxide~~	NO.	0.0	no turb
~~(5) Alkalinity~~			
~~(6) Chloride~~			

Additional Comments:

OTHER COMMENTS:

GROUNDWATER SAMPLING RECORD

MONITORING WELL ID: MW12

SAMPLING LOCATION: Eaker AFB - Former Military Gas Station (Job#: 734786.03000)
DATE AND TIME OF SAMPLING: 6/15, 1999 1545 a.m./p.m.
SAMPLE COLLECTED BY: : JPT of Parsons ES
WEATHER: Sunny, m.d. 80's

1. [X] **MONITORING WELL CONDITION:** New
   [ ] Locked [X] Unlocked
   Well Number: [ ] Is Apparent [ ] Is Not Apparent. Explain: not yet labeled
   Steel Casing Condition Is: NA
   Inner PVC Condition Is: New
   [ ] Deficiencies Corrected By Sample Collector
   [ ] Monitoring Well Required Repair (Describe): still needs grout from bentonite seal to surface + surface completion

2. [X] **PRODUCT INFORMATION:** not measured
   [ ] Product Observed At Depth Of _____ Feet Below Datum With _____
   [ ] Product Not Observed

3. [X] **WATER LEVEL:** not measured
   [ ] Water Depth Measured At _____ Feet Below Datum _____
   With _____
   [ ] Other. Explain: _____

4. [X] **MONITORING WELL EVACUATION:**
   Method: peristaltic pump
   Other, Describe: _____

5. [X] **ON-SITE MEASUREMENTS:**
   [ ] DIRECT INSTRUMENT READINGS

Time	1520	1530	1540				Measured With
Temp (°C)	21.3	21.0	21.0				Orion 250A
pH	6.46	6.60	6.47				"
Cond (µS/cm)	515	509	465				YSI 85
Do (mg/L)	0.63	0.61	0.55				YSI 85
Redox (mv)	-38.9	-63.9	-97.8				Orion 250A
gallons purged ~	16.5	17.0	17.5				

Additional Comments: _____

[X] FIELD CHEMISTRY RESULTS (See "Field Chemistry" Item #9)
[ ] NOT PERFORMED, EXPLAIN: _____

6. [ ] **MONITORING WELL EVACUATION OBSERVATIONS:**
   Final Water Level: _____ Feet Below Datum _____
   Final Observations: Water (slightly - very) cloudy
   Water level (rose - fell - no change)
   Volume Removed: _____
   Water odors/comments: purge water had a fuel odor and an oily sheen
   Other Comments: _____

Groundwater Sampling Record

MONITORING WELL No. MW013 (Cont'd)

7. [ ] SAMPLE CONTAINERS:

TIME SAMPLE COLLECTED: 1545 **DATE SAMPLE COLLECTED:** 6/15/99

DUPLICATE COLLECTED: YES/(NO)

DUPLICATE ID: _____ DUPLICATE SAMPLE TIME: _____

Quantity	Container Size	Container Type	Analysis	Preservative Type	Preservative Field/Lab	Filter Y/N
3	40 mL	Glass	BTEX, MTBE *	HCl	preserved	N
1	40 mL	"	BTEX via IA	none		

* method 8021 24-hr aver.

Sample Extraction Method: _____

8. [ ] CONTAINER HANDLING:

[ ] Container Sides Labeled

[ ] Container Lids Taped

[ ] Containers Placed in Ice Chest

9. [X] FIELD CHEMISTRY RESULTS

Analyte	Dilution?	Concentration	Observations/Notes
(1) Sulfate		9.1	
(2) Ferrous Iron		5.10 mg/L	
(3) Manganese			
(4) Carbon Dioxide			
(5) Alkalinity			
(6) Chloride			
Headspace (PID)		17.6 ppm	
BTEX via Immunoassay		> 3000 ppb	

Additional Comments: _____

OTHER COMMENTS: _____

GROUNDWATER SAMPLING RECORD

MONITORING WELL ID: 074-MW013

SAMPLING LOCATION: Eaker AFB - Former Military Gas Station (Job#: 734786.03000)

DATE AND TIME OF SAMPLING: 6/25/99, 1999 1350 a.m./p.m.

SAMPLE COLLECTED BY: : JDB, JPT of Parsons ES

WEATHER: 85° partly cloudy, very humid.

1. [ ] MONITORING WELL CONDITION:

[ ] Locked [X] Unlocked

Well Number: [X] Is Apparent [ ] Is Not Apparent. Explain:

Steel Casing Condition Is: Good

Inner PVC Condition Is: Good

[ ] Deficiencies Corrected By Sample Collector

[ ] Monitoring Well Required Repair (Describe): Locks should arrive today.

2. [ ] PRODUCT INFORMATION:

T.D = 32.59.

[ ] Product Observed At Depth Of _____ Feet Below Datum With _____

[X] Product Not Observed

3. [ ] WATER LEVEL:

[ ] Water Depth Measured At 10.50 Feet Below Datum T.O.C. (North Mark)

With Solinst.

[ ] Other. Explain:

4. [ ] MONITORING WELL EVACUATION:

Method: Peristaltic pump. Dedicated tubing

Other, Describe:

5. [ ] ON-SITE MEASUREMENTS:

[ ] DIRECT INSTRUMENT READINGS

Time start 12:14	1216	1226	1236	1253	13:06	13:16	Measured With
Temp (°C)	21.6	20.1	20.0	19.9	20.0	19.9	YSI 85
pH	6.63	6.66	6.66	6.66	6.57	6.64	ORION 250A
Cond (µS/cm)	552	538	508	475	473	468	YSI 85
Do (mg/L)	0.33	0.21	0.17	0.17	0.17	0.17	"
Redox (mv)	-55.0	-82.2	-93.5	-101.4	-107.6	-110.7	ORION 250A
gallons purged	1/2	2	4	7	10	12.5	Sqal bailer.

Additional Comments:

[X] FIELD CHEMISTRY RESULTS (See "Field Chemistry" Item #9)

[ ] NOT PERFORMED, EXPLAIN:

6. [ ] MONITORING WELL EVACUATION OBSERVATIONS:

Final Water Level: _____ Feet Below Datum _____

Final Observations:

Water (slightly - very) cloudy clear

Water level (rose - fell - no change)

Volume Removed: ~ 13 gal

Water odors/comments: Strong fuel odors

Other Comments:

Casing V = 3.6 gal; 3 x V = 10.8 gal.

Groundwater Sampling Record

MONITORING WELL No. MW013 (Cont'd)

7. [ ] SAMPLE CONTAINERS:

TIME SAMPLE COLLECTED: 1350 **DATE SAMPLE COLLECTED:** ~~1350~~ 6/25/04

DUPLICATE COLLECTED: YES/NO

DUPLICATE ID: 074-MW013-101 DUPLICATE SAMPLE TIME: 1405

Quantity	Container Size	Container Type	Analysis	Preservative Type Field/Lab	Filter Y/N
~~12~~ 12	40mL	VOA	USEPA 8260	HCL	NO
~~12~~ 12	"	"	GRO 5030/8015M	"	"
~~12~~ 12	"	"	RSK-175	"	"
8	1000 mL	G.A.	USEPA-3550/8015M		"
4	500mL	G.A.	USEPA 3550/8015	H_2SO_4	"
total = 48 pieces.					

Sample Extraction Method: peristaltic Bmp/Dedicated tubing.

8. [ ] CONTAINER HANDLING:

[X] Container Sides Labeled

[X] Container Lids Taped

[X] Containers Placed in Ice Chest

9. [ ] FIELD CHEMISTRY RESULTS

Analyte	Dilution?	Concentration	Observations/Notes
(1) Sulfate	No	0.0 mg/L	no turb in sample.
(2) Ferrous Iron	10mL sample : 40mL total ; 4.24mg/L x 4 =	16.96 ;	Dark Rust Color
(3) ~~Manganese~~			
(4) ~~Carbon Dioxide~~			
(5) ~~Alkalinity~~			
(6) ~~Chloride~~			

Additional Comments: New 100 mg/L Sulfate Standard Prepared, Meter Zeroed to 100 mg/L.

OTHER COMMENTS: MS/MSD collected At this Location

GROUNDWATER SAMPLING RECORD

MONITORING WELL ID: MW14

SAMPLING LOCATION: Eaker AFB - Former Military Gas Station (Job#: 734786.03000)

DATE AND TIME OF SAMPLING: 6/15/99, 1999 1900 a.m./p.m.

SAMPLE COLLECTED BY: : JPT of Parsons ES

WEATHER: Sunny, low 90's

1. [X] **MONITORING WELL CONDITION:** New, not completed bentonite seal placed, grout & surface completion to be performed w/in ~~2~~ 30 days.
   - [ ] Locked [ ] Unlocked
   - Well Number: [ ] Is Apparent [ ] Is Not Apparent. Explain: _____
   - Steel Casing Condition Is: _____
   - Inner PVC Condition Is: _____
   - [ ] Deficiencies Corrected By Sample Collector
   - [ ] Monitoring Well Required Repair (Describe): _____

2. [ ] **PRODUCT INFORMATION:**
   - [ ] Product Observed At Depth Of _____ Feet Below Datum With _____
   - [ ] Product Not Observed

3. [ ] **WATER LEVEL:**
   - [ ] Water Depth Measured At _____ Feet Below Datum _____ With _____
   - [ ] Other. Explain: _____

4. [ ] **MONITORING WELL EVACUATION:**
   - Method: Peristaltic Pump
   - Other, Describe: _____

5. [ ] **ON-SITE MEASUREMENTS:**

[ ] DIRECT INSTRUMENT READINGS

Time	~~1825~~ 1830	1845	1855				Measured With
Temp (°C)	21.1	21.0	21.0				Orion 250A
pH	6.70	6.70	6.70				"
Cond (µS/cm)	~~[illegible]~~376	379.5	380.8				YSI 85
Do (mg/L)	0.78	0.66	0.64				"
Redox (mv)	32.4	24.1	20.7				Orion 250A
gallons purged	0.5	1.5	2.5				

Additional Comments: _____

[ ] FIELD CHEMISTRY RESULTS (See "Field Chemistry" Item #9)

[ ] NOT PERFORMED, EXPLAIN: _____

6. [ ] **MONITORING WELL EVACUATION OBSERVATIONS:**
   - Final Water Level: _____ Feet Below Datum _____
   - Final Observations: Water (slightly - very) cloudy
   - Water level (rose - fell - no change)
   - Volume Removed: _____
   - Water odors/comments: _____
   - Other Comments: _____

Groundwater Sampling Record

MONITORING WELL No. MW 014 (Cont'd)

7. [ ] SAMPLE CONTAINERS:

TIME SAMPLE COLLECTED: 1900 **DATE SAMPLE COLLECTED:** 6/15/99

DUPLICATE COLLECTED: YES (NO)

DUPLICATE ID: _____ DUPLICATE SAMPLE TIME: _____

Quantity	Container Size	Container Type	Analysis	Preservative Type	Preservative Field/Lab	Filter Y/N
3	40 mL	glass VOA	BTEX, MTBE *	HCl	pre.	N
1	"	"	BTEX via IA	non		N

* method 8021 w/ 24 hr turn around

Sample Extraction Method: _____

8. [ ] CONTAINER HANDLING:

[ ] Container Sides Labeled

[ ] Container Lids Taped

[ ] Containers Placed in Ice Chest

9. [ ] FIELD CHEMISTRY RESULTS

Analyte	Dilution?	Concentration	Observations/Notes
(1) Sulfate		55.6	
(2) Ferrous Iron		2.65 mg/L	
(3) Manganese			
(4) Carbon Dioxide			
(5) Alkalinity			
(6) Chloride			
Headspace (PID)		0 ppm	
BTEX via IA		< 100 ppb	

Additional Comments: _____

OTHER COMMENTS: Slight odor of fuel, no sheen observed

GROUNDWATER SAMPLING RECORD

MONITORING WELL ID: 074-MW14

SAMPLING LOCATION: Eaker AFB - Former Military Gas Station (Job#: 734786.03000)

DATE AND TIME OF SAMPLING: 6/23/99, 1999 10:25 a.m./p.m.

SAMPLE COLLECTED BY: : JBR of Parsons ES

WEATHER: 80°F, Humid, partly cloudy.

1. [ ] MONITORING WELL CONDITION:

[ ] Locked [X] Unlocked

Well Number: [X] Is Apparent [ ] Is Not Apparent. Explain:

Steel Casing Condition Is: Good.

Inner PVC Condition Is: Good.

[ ] Deficiencies Corrected By Sample Collector -

[ ] Monitoring Well Required Repair (Describe): Locks should arrive today

2. [ ] PRODUCT INFORMATION:

[ ] Product Observed At Depth Of _____ Feet Below Datum With _____

[X] Product Not Observed

3. [ ] WATER LEVEL:

[ ] Water Depth Measured At 11.18 Feet Below Datum Top of PVC, Black mark.

With Solinist.

[ ] Other. Explain:

4. [ ] MONITORING WELL EVACUATION:

Method: Peristaltic Pump dedicated tubing

Other, Describe:

5. [ ] ON-SITE MEASUREMENTS:

[ ] DIRECT INSTRUMENT READINGS

Time ~~started~~ ~~0900~~	0910	0920	0930	0940	~~0955~~ 1016	10:06	Measured With	
Temp (°C)	20.4	19.7	19.8	19.7	19.4	19.5	19.5	YSI-85
pH	6.16	6.31	~~6.31~~ 6.41	6.46	6.54	6.55	6.55	ORION 250A
Cond (µS/cm)	961	768	622	548	481	463	462	YSI 85
Do (mg/L)	0.64	0.10	0.11	0.12	0.15	0.16	0.17	"
Redox (mv)	89.1	~~7.30~~	-52.7	-69.0	-76.3	-75.1	-73.2	ORION 250A
gallons purged	~1	2.5	3.5	5	7	9	10.5	5gal bucket

Additional Comments: Redox Reading at 0930 is not valid, meter not set on Proper mode.

[X] FIELD CHEMISTRY RESULTS (See "Field Chemistry" Item #9)

[ ] NOT PERFORMED, EXPLAIN:

6. [ ] MONITORING WELL EVACUATION OBSERVATIONS:

Final Water Level: _____ Feet Below Datum _____

Final Observations: Water (slightly - very) cloudy clear

Water level (rose - fell - no change)

Volume Removed: 12 gal

Water odors/comments: possible slight odor

Other Comments:

casing Vol = 3.8 gal 3xV = 11.4 gal.

Groundwater Sampling Record

MONITORING WELL No. MW014 (Cont'd)

7. [ ] **SAMPLE CONTAINERS:**

TIME SAMPLE COLLECTED: 10:25 **DATE SAMPLE COLLECTED:** 6/25/99

DUPLICATE COLLECTED: YES/NO

DUPLICATE ID: N/A DUPLICATE SAMPLE TIME: N/A

Quantity	Container Size	Container Type	Analysis	Preservative Type Field/Lab	Filter Y/N
3	40mL	VOA	826.0	HCL	NO
3	"	"	5030/8015M	"	"
3	"	"	RSK 175	None	"
2	1000 mL	G.A.	3550/8015	None	"
1	500 mL	"	E 353.2	H_2SO_4	"

Sample Extraction Method: peristaltic Pump.

8. [ ] **CONTAINER HANDLING:**

1.252

[X] Container Sides Labeled

[X] Container Lids Taped

[X] Containers Placed in Ice Chest

9. [ ] **FIELD CHEMISTRY RESULTS**

Analyte	Dilution?	Concentration	Observations/Notes
(1) Sulfate	NO	70.6 mg/L	White turbidity.
(2) Ferrous Iron	10mL sample + 30mL Hach = 2.91 x 3 = 8.73 mg/L.		Dark. Rust color.
(3) ~~Manganese~~			
(4) ~~Carbon Dioxide~~			
(5) ~~Alkalinity~~			
(6) ~~Chloride~~			

Additional Comments: DR/700 colorimeter Recalibrated, zeroed to 100 mg/L Standard.

OTHER COMMENTS:

GROUNDWATER SAMPLING RECORD

MONITORING WELL ID: ~~MW-15 I~~ 074-MW015I

SAMPLING LOCATION: Eaker AFB - Former Military Gas Station (Job#: 734786.03000)

DATE AND TIME OF SAMPLING: 6/24/99, 1999 1435 a.m./p.m.

SAMPLE COLLECTED BY: : JBB of Parsons ES

WEATHER: 85°C, Partly Cloudy, breezy, 5-10mph gusts, - Humid.

1. [ ] MONITORING WELL CONDITION:

[ ] Locked [X] Unlocked

Well Number: [ ] Is Apparent [X] Is Not Apparent. Explain: _____

Steel Casing Condition Is: N/A

Inner PVC Condition Is: Good

[ ] Deficiencies Corrected By Sample Collector

[ ] Monitoring Well Required Repair (Describe): surface completion not yet installed. T.D. was measured during Development yesterday to confirm intermediate and deep well locations

2. [ ] PRODUCT INFORMATION:

[ ] Product Observed At Depth Of NA Feet Below Datum With _____

[ ] Product Not Observed

3. [ ] WATER LEVEL:

[ ] Water Depth Measured At 11.65 Feet Below Datum T.O.C. - black mark at NORTH With _____

[ ] Other. Explain: _____

4. [ ] MONITORING WELL EVACUATION:

Method: Peristaltic Pump Geopump 2, Dedicated tubing.

Other, Describe: _____

5. [ ] ON-SITE MEASUREMENTS:

[ ] DIRECT INSTRUMENT READINGS

Time	11:02	11:12	1222	11:42	12:52	13:12	Measured With	13:26
Temp (°C)	22.7	20.6	20.8	21.2	21.1	21.3	YSI 85	21.2
pH	6.77	6.77	6.79	6.67	6.80	6.71	ORION 250A	6.81
Cond (µS/cm)	628	598	605	622	625	630	YSI-85	622
Do (mg/L)	1.18	0.07	0.10	0.12	0.12	0.13	YSI-85	0.14
Redox (mv)	+239.1	+178.9	+207.8	+23.8	+5.0	-54.0	ORION 250A	-66.4
gallons purged	0.25	2	3.5	5.7	8	11	5 gal bucket	12

Additional Comments: Reading taken w/ probes inserted in Flow-through Cell.

[ ] FIELD CHEMISTRY RESULTS (See "Field Chemistry" Item #9)

[ ] NOT PERFORMED, EXPLAIN: _____

6. [ ] MONITORING WELL EVACUATION OBSERVATIONS:

Final Water Level: _____ Feet Below Datum _____

Final Observations: Water (slightly - very) cloudy

Water level (rose - fell - no change)

Volume Removed: ~20 gal

Water odors/comments: moderate fuel odor.

Other Comments: Casing 4" = 5.3 gal 3x4" = 15.9 gal.

Groundwater Sampling Record

MONITORING WELL No. 074-MW015I ~~~ (Cont'd)

7. [ ] SAMPLE CONTAINERS:

TIME SAMPLE COLLECTED: 1435 **DATE SAMPLE COLLECTED:** 6/24/99

DUPLICATE COLLECTED: YES/NO

DUPLICATE ID: N/A DUPLICATE SAMPLE TIME: N/A

Quantity	Container Size	Container Type	Analysis	Preservative Type Field/Lab	Filter Y/N
3	40mL	VOA	BTEX 8260	HCL	NO
3	40 mL	"	Geochem. 310/8015M	HCL	↓
3	"	"	Meth. RSK 175	None	↓
2	1000 mL	G.A.	Diesel 3550/8015M	None	↓
1	500mL	G.A.	Nitrate. E353.2	H_2SO_4	↓

Sample Extraction Method: Peristaltic Pump, PVC tubing in well, Silicon tubing in pump, Sample taken from Silicon tubing.

8. [ ] CONTAINER HANDLING:

- [X] Container Sides Labeled
- [ ] Container Lids Taped
- [X] Containers Placed in Ice Chest

9. [ ] FIELD CHEMISTRY RESULTS

Analyte	Dilution?	Concentration	Observations/Notes
(1) Sulfate	NO	0.0	No Turbidity
(2) Ferrous Iron	YES. 10mL samp: 30mL total; 3.63 x 3 = 10.89		mg/L; Dark Rust color
~~(3) Manganese~~			
(4) ~~Carbon Dioxide~~			
~~(5) Alkalinity~~			
~~(6) Chloride~~			

Additional Comments: 2pt. calibration completed for sulfate. 0.0 and 100 mg/L. sample Filtered w/ In line Filter.

OTHER COMMENTS:

GROUNDWATER SAMPLING RECORD

MONITORING WELL ID: 074 - MW015D

SAMPLING LOCATION: Eaker AFB - Former Military Gas Station (Job#: 734786.03000)

DATE AND TIME OF SAMPLING: 6/24/99, 1999 1715 a.m./p.m.

SAMPLE COLLECTED BY: : JBB of Parsons ES

WEATHER: 85° Humid, Partly Cloudy

1. [ ] MONITORING WELL CONDITION:

[ ] Locked [X] Unlocked

Well Number: [ ] Is Apparent [X] Is Not Apparent. Explain:

Steel Casing Condition Is: Not Installed

Inner PVC Condition Is: good

[ ] Deficiencies Corrected By Sample Collector

[ ] Monitoring Well Required Repair (Describe): Surface completion not yet installed.

2. [ ] PRODUCT INFORMATION:

[ ] Product Observed At Depth Of N/A (NM) Feet Below Datum With N/A

[X] Product Not Observed

3. [ ] WATER LEVEL:

[ ] Water Depth Measured At 11.90 Feet Below Datum T.O.C. (PVC, mark at North) With Solinst.

[ ] Other. Explain:

4. [ ] MONITORING WELL EVACUATION:

Method: 23 gal purged with plastic down hole purge pump.

~~Other,~~ Describe: at 23 gal peristaltic pump tubing lowered into well and Field parameters were measured.

5. [ ] ON-SITE MEASUREMENTS:

[ ] DIRECT INSTRUMENT READINGS

Time	1636	1641	1656	~~1701~~	1710		Measured With
Temp (°C)	21.3	20.2	20.0	20.0	19.9		YSI 85
pH	6.86	6.95	6.95	6.95	6.95		ORION 250A
Cond (µS/cm)	438.9	490	486	487	482		YSI 85
Do (mg/L)	2.01	0.16	0.11	0.11	0.11		"
Redox (mv)	58.0	-47.1	-80.4	-91.0	-90.5		ORION 250A
gallons purged	23	25	28	29	31		5 gal bucket.

Additional Comments: Purged For Approx 20 min w/ Plastic Purge Pump. Prior to "on-site measurements" Being Read.

[X] FIELD CHEMISTRY RESULTS (See "Field Chemistry" Item #9)

[ ] ~~NOT PERFORMED,~~ EXPLAIN:

6. [ ] MONITORING WELL EVACUATION OBSERVATIONS:

Final Water Level: NM. Feet Below Datum N/A.

Final Observations: Water (slightly - very) cloudy

Water level (rose - fell - no change)

Volume Removed: ~33 gal.

Water odors/comments: slight Fuel odor.

Other Comments: casing vol = ~9gal 3x V = 27 gal

Groundwater Sampling Record

MONITORING WELL No. 074-MW015D (Cont'd)

7. [ ] SAMPLE CONTAINERS:

TIME SAMPLE COLLECTED: 1715 **DATE SAMPLE COLLECTED:** 6/24/99

DUPLICATE COLLECTED: YES/NO

DUPLICATE ID: N/A DUPLICATE SAMPLE TIME: N/A

Quantity	Container Size	Container Type	Analysis	Preservative Type Field/Lab	Filter Y/N
3	40mL VOA	→	USEPA 8260	HCL	NO
3	" "	→	5030/8015M	"	↓
3	" "	→	RSK 175	→ None	↓
2	1000mL	→ G.A.	~~8~~ 3550/8015M	None	↓
1	500mL	G.A.	E333.2	H_2SO_4	↓

Sample Extraction Method: peristaltic pump / dedicated tubing (Silicon / PVC).

8. [ ] CONTAINER HANDLING:

- [X] Container Sides Labeled
- [X] Container Lids Taped
- [X] Containers Placed in Ice Chest

9. [ ] FIELD CHEMISTRY RESULTS

Analyte	Dilution?	Concentration	Observations/Notes
(1) Sulfate	No	4.0 mg/L	slight white turb.
(2) Ferrous Iron	10mL sample to 30mL total.	2.32 mg/L × 3 = 6.96 mg/L	Med. Rust Color.
~~(3) Manganese~~			
~~(4) Carbon Dioxide~~			
~~(5) Alkalinity~~			
~~(6) Chloride~~			

Additional Comments: Sulfate calibrated to S2 = 100mg/L., zeroed to ground water sample. Sample not Filtered, Diluted with DI Water For Ferrous IRON.

OTHER COMMENTS: none.

GROUNDWATER SAMPLING RECORD

MONITORING WELL ID: ~~MW-66~~ MW016

SAMPLING LOCATION: Eaker AFB - Former Military Gas Station (Job#: 734786.03000)

DATE AND TIME OF SAMPLING: 6/26/99, 1999 12:55 a.m./(p.m.)

SAMPLE COLLECTED BY: : JBB, JPT of Parsons ES

WEATHER: Raining 75°F, calm wind.

1. [ ] MONITORING WELL CONDITION:

[ ] Locked [X] Unlocked

Well Number: [X] Is Apparent [ ] Is Not Apparent. Explain:

Steel Casing Condition Is: Good

Inner PVC Condition Is: Good

[ ] Deficiencies Corrected By Sample Collector

[ ] Monitoring Well Required Repair (Describe):

2. [ ] PRODUCT INFORMATION:

[ ] Product Observed At Depth Of 1 Feet Below Datum With

[X] Product Not Observed

3. [ ] WATER LEVEL:

[ ] Water Depth Measured At ~~11.56~~ 11.40 Feet Below Datum

With Solinist

[ ] Other. Explain:

4. [ ] MONITORING WELL EVACUATION:

Method: Peristaltic Pump.

Other, Describe:

5. [ ] ON-SITE MEASUREMENTS:

[ ] DIRECT INSTRUMENT READINGS

Time Start 11:39	1142	1200	1215	1225	12:36	1246.	Measured With
Temp (°C)	20.0	~~21.79~~	19.6	19.6	19.6	19.6	YSI 85
pH	6.66.	6.34	6.44	6.42	6.41	6.40	ORION 250A
Cond (µS/cm)	848	579	462.0	367.5	352.2	334.5	YSI-85
Do (mg/L)	0.25	0.17	0.14	0.13	0.14	0.13	" "
Redox (mv)	270.5	277.6	273.8	371.1	380.7	380.7	ORION 250A.
gallons purged	.75	3.75	6	8	10.5	13	5 gal bucket.

Additional Comments:

[ ] FIELD CHEMISTRY RESULTS (See "Field Chemistry" Item #9)

[ ] NOT PERFORMED, EXPLAIN:

6. [ ] MONITORING WELL EVACUATION OBSERVATIONS:

Final Water Level: Feet Below Datum

Final Observations: Water (slightly - very) cloudy

Water level (rose - fell - no change)

Volume Removed:

Water odors/comments:

Other Comments:

Casing 4" = 3.8 gal.

3" = 11.4 gal

Groundwater Sampling Record

MONITORING WELL No. MW016 (Cont'd)

7. [ ] **SAMPLE CONTAINERS:**

TIME SAMPLE COLLECTED: 12:55 **DATE SAMPLE COLLECTED:** 6/26/93

DUPLICATE COLLECTED: YES (NO)

DUPLICATE ID: N/A DUPLICATE SAMPLE TIME: N/A

Quantity	Container Size	Container Type	Analysis	Preservative Type	Preservative Field/(Lab)	Filter Y/N
3	40mL	VOA	8260	HCl		
3	"	"	5030/8015 M	"		
3	"	"	RSK-175	"		
2	1000mL	G.A.	3550/8015M	None		
1	500mL	"	E 353.2	H_2SO_4		

Sample Extraction Method: peristaltic pump.

8. [ ] **CONTAINER HANDLING:**

- [ ] Container Sides Labeled
- [ ] Container Lids Taped
- [ ] Containers Placed in Ice Chest

9. [ ] **FIELD CHEMISTRY RESULTS**

Analyte	Dilution?	Concentration	Observations/Notes
(1) Sulfate	NO	60.0 mg/L	Very Turbid. - white color.
(2) Ferrous Iron	NO	0.42 mg/L	very Light Rust color.
~~(3) Manganese~~			
(4) Carbon Dioxide			
~~(5) Alkalinity~~			
~~(6) Chloride~~			

Additional Comments: Sulfate ~~Zeroed~~ to 100 mg/L standard (S2)

OTHER COMMENTS:

GROUNDWATER SAMPLING RECORD

MONITORING WELL ID: MW-017

SAMPLING LOCATION: Eaker AFB - Former Military Gas Station (Job#: 734786.03000)

DATE AND TIME OF SAMPLING: 6/26/99, 1999 1700 a.m./p.m.

SAMPLE COLLECTED BY: : JBB, JPT. of Parsons ES

WEATHER: Raining, 80° F, Humid.

1. [ ] MONITORING WELL CONDITION:

[ ] Locked [X] Unlocked

Well Number: [X] Is Apparent [ ] Is Not Apparent. Explain:

Steel Casing Condition Is: Good

Inner PVC Condition Is: Good.

[X] Deficiencies Corrected By Sample Collector - lock placed on well cap.

[ ] Monitoring Well Required Repair (Describe):

2. [ ] PRODUCT INFORMATION:

[ ] Product Observed At Depth Of _____ Feet Below Datum With _____

[X] Product Not Observed

3. [ ] WATER LEVEL:

[X] Water Depth Measured At 10.54 Feet Below Datum T.O.C.

With Solinst

[ ] Other. Explain:

4. [ ] MONITORING WELL EVACUATION:

Method: Plastic Purge Pump / Dedicated Tubing.

Other, Describe:

5. [ ] ON-SITE MEASUREMENTS:

[ ] DIRECT INSTRUMENT READINGS

Time Start 3. 15:57	16:27	16:37	16:47				Measured With
Temp (°C)	19.0	19.0	19.0				
pH	6.56	6.54	6.48				
Cond (µS/cm)	271.1	265.0	261.9				
Do (mg/L)	0.19	0.15	0.15				
Redox (mv)	198.6	185.9	230.4				
gallons purged	16.5	19	23.5				

Additional Comments: at 16:18, Purge pump was disconnected and peristaltic pump was used, 15 gal was purged w/ the purge pump.

[X] FIELD CHEMISTRY RESULTS (See "Field Chemistry" Item #9)

[ ] NOT PERFORMED, EXPLAIN:

6. [ ] MONITORING WELL EVACUATION OBSERVATIONS:

Final Water Level: _____ Feet Below Datum _____

Final Observations: Water (slightly - very) cloudy

Water level (rose - fell - no change)

Volume Removed:

Water odors/comments:

Other Comments:

Casing 4" = 6.4 gal

3" = 19.2 gal.

Groundwater Sampling Record

MONITORING WELL No. MW-07 (Cont'd)

7. [ ] **SAMPLE CONTAINERS:**

TIME SAMPLE COLLECTED: 1700 **DATE SAMPLE COLLECTED:** 6/26/95

DUPLICATE COLLECTED: YES/(NO)

DUPLICATE ID: N/A DUPLICATE SAMPLE TIME: N/A

Quantity	Container Size	Container Type	Analysis	Preservative Type Field/Lab	Filter Y/N
3	40mL	VOA		HCL	NO
3	"	"		"	"
3	"	"		"	"
2	1000mL	G.A		None	"
1	500 mL	G.A		H_2SO_4	"

Sample Extraction Method: peristaltic pump dedicated tubing

8. [ ] **CONTAINER HANDLING:**

[X] Container Sides Labeled

[X] Container Lids Taped

[X] Containers Placed in Ice Chest

9. [ ] **FIELD CHEMISTRY RESULTS**

Analyte	Dilution?	Concentration	Observations/Notes
(1) Sulfate	NO	15.1 mg/L	Slight White turb.
(2) Ferrous Iron	2mL samp: 40mL	total: 1.46 x 2 = 2.92	mg/L; Light Rust color
(3) ~~Manganese~~ Fe^{2+}	No Dilution	3.15 mg/L	med. Rust color.
(4) ~~Carbon Dioxide~~			
(5) ~~Alkalinity~~ Sulfate	NO	0.0 mg/L	Same sample as Above.
(6) Chloride			

Additional Comments: Sulfate (1) was zeroed to sample water as 0.0 mg/L

Sulfate (2) was zeroed to a standard as 100 mg/L

A slight turbidity did appear in the Accurate Sample.

OTHER COMMENTS:

GROUNDWATER SAMPLING RECORD

MONITORING WELL ID: MW-018

SAMPLING LOCATION: Eaker AFB - Former Military Gas Station (Job#: 734786.03000)

DATE AND TIME OF SAMPLING: 6/26/99, 1999 1520 a.m./p.m.

SAMPLE COLLECTED BY: : JSB, JRT. of Parsons ES

WEATHER: Raining, 80°F no wind. Very Humid.

1. [ ] MONITORING WELL CONDITION:

[ ] Locked [X] Unlocked

Well Number: [X] Is Apparent [ ] Is Not Apparent. Explain: _____

Steel Casing Condition Is: Good.

Inner PVC Condition Is: Good.

[ ] Deficiencies Corrected By Sample Collector

[ ] Monitoring Well Required Repair (Describe): _____

2. [ ] PRODUCT INFORMATION:

[ ] Product Observed At Depth Of _____ Feet Below Datum With _____

[X] Product Not Observed

3. [ ] WATER LEVEL:

[ ] Water Depth Measured At 11.88 Feet Below Datum T.O.C. North Mark.

With Solinst.

[ ] Other. Explain: _____

4. [ ] MONITORING WELL EVACUATION:

Method: Peristaltic Pump / Dedicated Tubing.

Other, Describe: n/a.

5. [ ] ON-SITE MEASUREMENTS:

[ ] DIRECT INSTRUMENT READINGS

Time start 1342	1343	1358.	1419	1439	1454	1508	Measured With
Temp (°C)	20.4	19.7.	19.6	19.3	19.3	19.2	YSI-85
pH 6.60 → 6.64	6.64	6.45.	6.56	6.71	6.58	6.50	ORION 250A
Cond (µS/cm)	355.3	423.8	427.1	414.1	415.1	408.8	YSI 85
Do (mg/L)	0.63	0.18	0.16	0.14	0.15	0.14	" "
Redox (mv)	423.3	~~211.5~~ 221.5	116.7	174.1	236.0	210.1	ORION 250A
gallons purged	1/2	4.	7.5	12 15	16	20	5 gal bucket.

Additional Comments: _____

[X] FIELD CHEMISTRY RESULTS (See "Field Chemistry" Item #9)

[ ] NOT PERFORMED, EXPLAIN: _____

6. [ ] MONITORING WELL EVACUATION OBSERVATIONS:

Final Water Level: _____ Feet Below Datum _____

Final Observations: Water (slightly - very) cloudy clear.

Water level (rose - fell - ~~no change~~)

Volume Removed: _____

Water odors/comments: no odors

Other Comments: _____

casing 4" = 6.4 gal 3" = 19.2 gal

Groundwater Sampling Record

MONITORING WELL No. MW-018 (Cont'd)

7. [ ] **SAMPLE CONTAINERS:**

TIME SAMPLE COLLECTED: 1520 **DATE SAMPLE COLLECTED:** 6/26/97

DUPLICATE COLLECTED: YES/(NO)

DUPLICATE ID: N/A DUPLICATE SAMPLE TIME: N/A

Quantity	Container Size	Container Type	Analysis	Preservative Type Field/(Lab)	Filter Y/N
3	40mL	VOA	EPA 8260	HCL	NO
3	"	"	5030/8015M	"	"
3	"	"	RSK-175	"	"
2	1000mL	G.A.	3550/8015M	None	"
1	500 mL	G.A.	E353.2	H_2SO_4	"

Sample Extraction Method: Bailer: Pump/dedicated tubing

8. [ ] **CONTAINER HANDLING:**

- [X] Container Sides Labeled
- [X] Container Lids Taped
- [X] Containers Placed in Ice Chest

9. [ ] **FIELD CHEMISTRY RESULTS**

Analyte	Dilution?	Concentration	Observations/Notes
(1) Sulfate	NO	14.0	white turb.
(2) Ferrous Iron	Yes - 2mL sample: 40mL total.	4.05 x 2 =	8.10 mg/L; Dark Rust color
(3) Manganese			
(4) Carbon Dioxide			
(5) Alkalinity			
(6) Chloride			

Additional Comments:

OTHER COMMENTS:

GROUNDWATER SAMPLING RECORD

MONITORING WELL ID: TW 074-SB009

SAMPLING LOCATION: Eaker AFB - Former Military Gas Station (Job#: 734786.03000)

DATE AND TIME OF SAMPLING: 6/14/99, 1999 1420 a.m./(p.m.)

SAMPLE COLLECTED BY: : JPT of Parsons ES

WEATHER: Sunny, mid 80's

1. [√] **MONITORING WELL CONDITION:** NA, screenpoint 15 GW sample collected from boring

[ ] Locked [ ] Unlocked

Well Number: [ ] Is Apparent [ ] Is Not Apparent. Explain:

Steel Casing Condition Is:

Inner PVC Condition Is:

[ ] Deficiencies Corrected By Sample Collector

[ ] Monitoring Well Required Repair (Describe):

2. [√] **PRODUCT INFORMATION:**

[ ] Product Observed At Depth Of _____ Feet Below Datum With _____

[X] Product Not Observed

3. [√] **WATER LEVEL:** NM/NA

[ ] Water Depth Measured At _____ Feet Below Datum _____

With _____

[ ] Other. Explain:

4. [√] **MONITORING WELL EVACUATION:**

Method: peristaltic pump

Other, Describe:

5. [ ] **ON-SITE MEASUREMENTS:**

[ ] DIRECT INSTRUMENT READINGS

Time	1425						Measured With
Temp (°C)	21.2						
pH	6.21						
Cond (µS/cm)	288.9						
Do (mg/L)	0.44						
Redox (mv)	10.6						
gallons purged	~1gal						

Additional Comments:

[X] FIELD CHEMISTRY RESULTS (See "Field Chemistry" Item #9)

[ ] NOT PERFORMED, EXPLAIN:

6. [ ] **MONITORING WELL EVACUATION OBSERVATIONS:**

Final Water Level: NA Feet Below Datum NA

Final Observations: Water (slightly - very) cloudy

Water level (rose - fell - no change)

Volume Removed: ~3 gallons

Water odors/comments: no odor / sheen

Other Comments:

Groundwater Sampling Record

MONITORING WELL No. 674-38009 TW (Cont'd)

7. [X] **SAMPLE CONTAINERS:**

TIME SAMPLE COLLECTED: 1440 **DATE SAMPLE COLLECTED:** 6/16/99

DUPLICATE COLLECTED: YES (NO)

DUPLICATE ID: _____ DUPLICATE SAMPLE TIME: _____

Quantity	Container Size	Container Type	Analysis	Preservative Type	Preservative Field/Lab	Filter Y/N
3	40 mL	Glass Vial	BTEX/MTBE	HCl	pre.	N

Sample Extraction Method: _____

8. [X] **CONTAINER HANDLING:**

- [X] Container Sides Labeled
- [ ] Container Lids Taped
- [X] Containers Placed in Ice Chest

9. [ ] **FIELD CHEMISTRY RESULTS**

Analyte	Dilution?	Concentration	Observations/Notes
(1) Sulfate		158.1 / 7.7	Sample very turbid, not available / readings
(2) Ferrous Iron		5.10 / >5.10	" " " " "
(3) Manganese			
(4) Carbon Dioxide			
(5) Alkalinity			
(6) Chloride			
PID headspace		0.0	
BTEX Immunoassay		≤ 100 ppb	done @ ~2000, 6/16/99

↑ at 1945 6/16/99 J.T.

Additional Comments: _____

OTHER COMMENTS: screen exposed from 28'-32' bgs. no fuel odor or sheen. purge water is fairly turbid

GROUNDWATER SAMPLING RECORD

MONITORING WELL ID: TW01 ~~SB10~~ 1574-

SAMPLING LOCATION: Eaker AFB - Former Military Gas Station (Job#: 734786.03000)

DATE AND TIME OF SAMPLING: ~~6/16~~ 6/17, 1999 0910 a.m./p.m.

SAMPLE COLLECTED BY: : JPT of Parsons ES

WEATHER: Sunny, low 70's

1. [√] **MONITORING WELL CONDITION:** NA, Screenpoint Sample

[ ] Locked [ ] Unlocked

Well Number: [ ] Is Apparent [ ] Is Not Apparent. Explain: _____

Steel Casing Condition Is: _____

Inner PVC Condition Is: _____

[ ] Deficiencies Corrected By Sample Collector

[ ] Monitoring Well Required Repair (Describe): _____

2. [√] **PRODUCT INFORMATION:**

[ ] Product Observed At Depth Of _____ Feet Below Datum With _____

[√] Produ : Not Observed

3. [√] **WATER LEVEL:** Not Measured

[ ] Water Depth Measured At _____ Feet Below Datum _____ With _____

[ ] Other. Explain: _____

4. [√] **MONITORING WELL EVACUATION:**

Method: peristaltic pump

Other, Describe: _____

5. [√] **ON-SITE MEASUREMENTS:**

[√] DIRECT INSTRUMENT READINGS

Time	0920						Measured With
Temp (°C)	20.1						
pH	6.41						
Cond (µS/cm)	259.2						
Do (mg/L)	0.48						
Redox (mv)	21.1						
gallons purged	2						

Additional Comments: _____

[ ] FIELD CHEMISTRY RESULTS (See "Field Chemistry" Item #9)

[ ] NOT PERFORMED, EXPLAIN: _____

6. [ ] **MONITORING WELL EVACUATION OBSERVATIONS:** NA

Final Water Level: _____ Feet Below Datum _____

Final Observations: Water (slightly - very) cloudy

Water level (rose - fell - no change)

Volume Removed: ~ 2.5-3 gal.

Water odors/comments: no odor / sheen

Other Comments: _____

Groundwater Sampling Record

MONITORING WELL No. ~~C74-State~~ Tw010 (Cont'd)

7. [ ] **SAMPLE CONTAINERS:**

TIME SAMPLE COLLECTED: 0930 **DATE SAMPLE COLLECTED:** 6/17/99

DUPLICATE COLLECTED: YES/NO

DUPLICATE ID: _____ DUPLICATE SAMPLE TIME: _____

Quantity	Container Size	Container Type	Analysis	Preservative Type	Preservative Field/Lab	Filter Y/N
3	40 mL	Glass Vial	BTEX/MTBE	HCl	FR	N

Sample Extraction Method: _____

8. [✓] **CONTAINER HANDLING:**

- [X] Container Sides Labeled
- [X] Container Lids Taped
- [X] Containers Placed in Ice Chest

9. [ ] **FIELD CHEMISTRY RESULTS**

Analyte	Dilution?	Concentration	Observations/Notes
(1) Sulfate		30.9 mg/L	sample allowed to settle ~ 1.5 hrs. but still turbid slightly
(2) Ferrous Iron		>5.10 mg/L	SAA but color still was a dark red
(3) Manganese			
(4) Carbon Dioxide			
(5) Alkalinity			
(6) Chloride			
Headspace-		-1.1 ppm	
BTEX via IA		< 100 ppb	potential problem with kit

Additional Comments: _____

OTHER COMMENTS: _____

GROUNDWATER SAMPLING RECORD

MONITORING WELL ID: TW011

SAMPLING LOCATION: Eaker AFB - Former Military Gas Station (Job#: 734786.03000)
DATE AND TIME OF SAMPLING: 6/17/99, 1999 1315 a.m./(p.m.)
SAMPLE COLLECTED BY: : JPT of Parsons ES
WEATHER: Sunny, low 80's

1. [√] **MONITORING WELL CONDITION:** NA, screenpoint sample 29-33' bgs
   [ ] Locked [ ] Unlocked
   Well Number: [ ] Is Apparent [ ] Is Not Apparent. Explain: _____
   Steel Casing Condition Is: _____
   Inner PVC Condition Is: _____
   [ ] Deficiencies Corrected By Sample Collector
   [ ] Monitoring Well Required Repair (Describe): _____

2. [ ] **PRODUCT INFORMATION:**
   [ ] Product Observed At Depth Of _____ Feet Below Datum With _____
   [ ] Product Not Observed

3. [√] **WATER LEVEL:** NA/NM
   [ ] Water Depth Measured At _____ Feet Below Datum _____
   With _____
   [ ] Other. Explain: _____

4. [√] **MONITORING WELL EVACUATION:**
   Method: peristaltic pump
   Other, Describe: _____

5. [ ] **ON-SITE MEASUREMENTS:**
   [ ] DIRECT INSTRUMENT READINGS

Time	1350						Measured With
Temp (°C)	20.9						
pH	6.53						
Cond (µS/cm)	354.3						
Do (mg/L)	0.36						
Redox (mv)	-71.1						
gallons purged	~2.5						

Additional Comments: _____

[ ] FIELD CHEMISTRY RESULTS (See "Field Chemistry" Item #9)
[ ] NOT PERFORMED, EXPLAIN: _____

6. [ ] **MONITORING WELL EVACUATION OBSERVATIONS:** ~~NA~~
   Final Water Level: NA Feet Below Datum NA
   Final Observations: Water (slightly - very) cloudy
   Water level (rose - fell - no change)
   Volume Removed: ~3-4 gal.
   Water odors/comments: no odor / sheen *
   Other Comments: _____

* Slight sheen in purge water after sitting for ~1 hr

Groundwater Sampling Record

MONITORING WELL No. TW011 (Cont'd)

7. [ ] **SAMPLE CONTAINERS:**

TIME SAMPLE COLLECTED: 1400 **DATE SAMPLE COLLECTED:** 6/17/99

DUPLICATE COLLECTED: YES/NO

DUPLICATE ID: 074-TW011-101 DUPLICATE SAMPLE TIME: 1405

	Quantity	Container Size	Container Type	Analysis	Preservative Type	Preservative Field/Lab	Filter Y/N
-001	3	40 mL	Glass VOA	BTEX/MTBE	HCl	pres	N
-101	3	"	"	"	"	"	"

Sample Extraction Method: _____

8. [ ] **CONTAINER HANDLING:**

- [ ] Container Sides Labeled
- [ ] Container Lids Taped
- [ ] Containers Placed in Ice Chest

9. [ ] **FIELD CHEMISTRY RESULTS**

Analyte	Dilution?	Concentration	Observations/Notes
(1) Sulfate		10.41 mg/L	
(2) Ferrous Iron		>5.10 mg/L	
(3) Manganese			
(4) Carbon Dioxide			
(5) Alkalinity			
(6) Chloride			
PID Headspace		≤ -0.3	relative to background
BTEX via Immuno Assay		<0.1 ppm	

Additional Comments: _____

OTHER COMMENTS: _____

GROUNDWATER SAMPLING RECORD

MONITORING WELL ID: TW012I

SAMPLING LOCATION: Eaker AFB - Former Military Gas Station (Job#: 734786.03000)

DATE AND TIME OF SAMPLING: 6/18, 1999 ~~1000~~ 1005 a.m./p.m.

SAMPLE COLLECTED BY: : JPT of Parsons ES

WEATHER: Sunny, 70's

1. [✓] **MONITORING WELL CONDITION:** NA, screenpoint sampler from 40-44' bgs
   - [ ] Locked [ ] Unlocked
   - Well Number: [ ] Is Apparent [ ] Is Not Apparent. Explain:
   - Steel Casing Condition Is:
   - Inner PVC Condition Is:
   - [ ] Deficiencies Corrected By Sample Collector
   - [ ] Monitoring Well Required Repair (Describe):

2. [✓] **PRODUCT INFORMATION:** odor, not measured
   - [ ] Product Observed At Depth Of _____ Feet Below Datum With _____
   - [ ] Product Not Observed

3. [✓] **WATER LEVEL:** NA/NM
   - [ ] Water Depth Measured At _____ Feet Below Datum _____ With _____
   - [ ] Other. Explain:

4. [ ] **MONITORING WELL EVACUATION:**
   - Method: peristaltic pump
   - Other, Describe:

5. [✓] **ON-SITE MEASUREMENTS:**

[ ] DIRECT INSTRUMENT READINGS

Time	1000	~~1020~~	1025				Measured With
Temp (°C)	20.1		20.2				
pH	6.73		6.62				
Cond (µS/cm)	700		733				
Do (mg/L)	0.29		0.38				
Redox (mv)		~~-5.0~~	-84.2				
gallons purged	~5	~~~9~~	~10.5				

Additional Comments: Redox took a long time to stabilize

[✓] FIELD CHEMISTRY RESULTS (See "Field Chemistry" Item #9)

[ ] NOT PERFORMED, EXPLAIN:

6. [✓] **MONITORING WELL EVACUATION OBSERVATIONS:**
   - Final Water Level: _____ Feet Below Datum _____
   - Final Observations: Water (slightly - very) cloudy
   - Water level (rose - fell - no change)
   - Volume Removed: ~11 gal.
   - Water odors/comments: Strong fuel odor / sheen
   - Other Comments:

Groundwater Sampling Record

MONITORING WELL No. TW012 (Cont'd)

7. [✓] **SAMPLE CONTAINERS:**

TIME SAMPLE COLLECTED: 1030 **DATE SAMPLE COLLECTED:** 6/18/99

DUPLICATE COLLECTED: YES (NO)

DUPLICATE ID: _____ DUPLICATE SAMPLE TIME: _____

Quantity	Container Size	Container Type	Analysis	Preservative Type	Preservative Field/Lab	Filter Y/N
3	40mL	Glass VOA	BTEX/MTBE	HCl	pre	no

Sample Extraction Method: _____

8. [✓] **CONTAINER HANDLING:**

- [✓] Container Sides Labeled
- [✓] Container Lids Taped
- [✓] Containers Placed in Ice Chest

9. [✓] **FIELD CHEMISTRY RESULTS**

Analyte	Dilution?	Concentration	Observations/Notes
(1) Sulfate		3.6	
(2) Ferrous Iron	1/3, 1/5, 1/10	15.3, 24.5, 29.8	avg. = 27.1
(3) Manganese			
(4) Carbon Dioxide			
(5) Alkalinity			
(6) Chloride			
Headspace/PID		23.4 ppm	above background
BTEX via IA		500 ppb < sample < 3,000 ppb	

First round sample up inline 0.45 Geotech filter

Additional Comments: _____

OTHER COMMENTS: sample taken from ~~15~~ 13'-17' below ~~top~~ of sand aquifer

GROUNDWATER SAMPLING RECORD

MONITORING WELL ID: TW012D

SAMPLING LOCATION: Eaker AFB - Former Military Gas Station (Job#: 734786.03000)

DATE AND TIME OF SAMPLING: 6/18/99, 1999 1830 a.m. (p.m.)

SAMPLE COLLECTED BY: : JPT of Parsons ES

WEATHER: mid-80's sunny

1. [✓] **MONITORING WELL CONDITION:** NA, screenpoint @ 56-60' bgs (29-33' below top of casing)
   - [ ] Locked [ ] Unlocked
   - Well Number: [ ] Is Apparent [ ] Is Not Apparent. Explain: _____
   - Steel Casing Condition Is: _____
   - Inner PVC Condition Is: _____
   - [ ] Deficiencies Corrected By Sample Collector
   - [ ] Monitoring Well Required Repair (Describe): _____

2. [ ] **PRODUCT INFORMATION:** NA/NM
   - [ ] Product Observed At Depth Of _____ Feet Below Datum With _____
   - [ ] Product Not Observed

3. [✓] **WATER LEVEL:** NA/NM
   - [ ] Water Depth Measured At _____ Feet Below Datum _____ With _____
   - [ ] Other. Explain: _____

4. [✓] **MONITORING WELL EVACUATION:**
   - Method: peristaltic pump
   - Other, Describe: _____

5. [✓] **ON-SITE MEASUREMENTS:**

[ ] DIRECT INSTRUMENT READINGS

Time	1805	1815	1820				Measured With
Temp (°C)	20.5	20.3	20.4				
pH	6.84	6.90	6.88				
Cond (µS/cm)	525	523	525				
Do (mg/L)	0.39	0.26	0.26				
Redox (mv)	130.1	-68.5	-87.9				
gallons purged	~3	~4.5	~5				

Additional Comments: _____

[ ] FIELD CHEMISTRY RESULTS (See "Field Chemistry" Item #9)

[ ] NOT PERFORMED, EXPLAIN: _____

6. [✓] **MONITORING WELL EVACUATION OBSERVATIONS:**
   - Final Water Level: _____ Feet Below Datum _____
   - Final Observations: Water (slightly - very) cloudy
   - Water level (rose - fell - no change)
   - Volume Removed: ~7 gal
   - Water odors/comments: no odor / silvery
   - Other Comments: _____

Groundwater Sampling Record

MONITORING WELL No. TW012 (Cont'd) 56-60' BGS

7. [✓] **SAMPLE CONTAINERS:**

TIME SAMPLE COLLECTED: 1830 **DATE SAMPLE COLLECTED:** ~~1830~~ 6/18/09

DUPLICATE COLLECTED: YES (NO)

DUPLICATE ID: _____ DUPLICATE SAMPLE TIME: _____

Quantity	Container Size	Container Type	Analysis	Preservative Type	Preservative Field/Lab	Filter Y/N
3	40mL	Glass VOA	BTEX/MTBE	HCl	pre	N

Sample Extraction Method: _____

8. [✓] **CONTAINER HANDLING:**

- [✓] Container Sides Labeled
- [✓] Container Lids Taped
- [✓] Containers Placed in Ice Chest

9. [✓] **FIELD CHEMISTRY RESULTS**

Analyte	Dilution?	Concentration	Observations/Notes
(1) Sulfate	N	40.2 mg/L	
(2) Ferrous Iron	1/10	1.43 mg/L	actual = 14.3 mg/L
(3) Manganese			
(4) Carbon Dioxide			
(5) Alkalinity			
(6) Chloride			
Headspace		- 0.9 ppm	relative to background
BTEX via Immunoassay		< 100 ppm	

used 0.45 μ filter

Additional Comments: _____

OTHER COMMENTS: _____

GROUNDWATER SAMPLING RECORD

MONITORING WELL ID: TW013

SAMPLING LOCATION: Eaker AFB - Former Military Gas Station (Job#: 734786.03000)
DATE AND TIME OF SAMPLING: 6/18, 1999 ~~1540~~ 1610 a.m./p.m.
SAMPLE COLLECTED BY: : JPT of Parsons ES
WEATHER: _____

1. [✓] **MONITORING WELL CONDITION:** NA, screenpoint from 29-33' bgs
   [ ] Locked [ ] Unlocked
   Well Number: [ ] Is Apparent [ ] Is Not Apparent. Explain: _____
   Steel Casing Condition Is: _____
   Inner PVC Condition Is: _____
   [ ] Deficiencies Corrected By Sample Collector
   [ ] Monitoring Well Required Repair (Describe): _____

2. [✓] **PRODUCT INFORMATION:** NA
   [ ] Product Observed At Depth Of _____ Feet Below Datum With _____
   [ ] Product Not Observed

3. [✓] **WATER LEVEL:** NA
   [ ] Water Depth Measured At _____ Feet Below Datum _____
   With _____
   [ ] Other. Explain: _____

4. [✓] **MONITORING WELL EVACUATION:**
   Method: peristaltic pump
   Other, Describe: _____

5. [ ] **ON-SITE MEASUREMENTS:**
   [ ] DIRECT INSTRUMENT READINGS

Time	1545	1555	1605				Measured With
Temp (°C)	21.2	21.0	20.9				
pH	6.55	6.60	6.59				
Cond (µS/cm)	307.1	302.9	302.0				
Do (mg/L)	0.26	0.21	0.19				
Redox (mv)	-42.2	-64.9	-79.1				
gallons purged	~~~2.5 gal~~	~4.5	~6.0				

Additional Comments: _____

[✓] FIELD CHEMISTRY RESULTS (See "Field Chemistry" Item #9)
[ ] NOT PERFORMED, EXPLAIN: _____

6. [✓] **MONITORING WELL EVACUATION OBSERVATIONS:**
   Final Water Level: _____ Feet Below Datum _____
   Final Observations: Water (slightly) - very) cloudy
   Water level (rose - fell - no change)
   Volume Removed: ~7.5 gal
   Water odors/comments: no odor - slt brown
   Other Comments: _____

Groundwater Sampling Record

MONITORING WELL No. TW013 (Cont'd)

7. [✓] **SAMPLE CONTAINERS:**

TIME SAMPLE COLLECTED: ~~1540~~ 1610 **DATE SAMPLE COLLECTED:** 6/18/99

DUPLICATE COLLECTED: YES/(NO)

DUPLICATE ID: _____ DUPLICATE SAMPLE TIME: _____

Quantity	Container Size	Container Type	Analysis	Preservative Type	Preservative Field/Lab	Filter Y/N
3	40mL	Glass VOA	BTEX/MTBE	HCl	pre	N

Sample Extraction Method: _____

8. [✓] **CONTAINER HANDLING:**

[✓] Container Sides Labeled

[✓] Container Lids Taped

[✓] Containers Placed in Ice Chest

9. [✓] **FIELD CHEMISTRY RESULTS**

Analyte	Dilution?	Concentration	Observations/Notes
(1) Sulfate	NO	3.8 mg/L	
(2) Ferrous Iron	Yes	1.52 mg/L	actual conc. = 15.2 mg/L
(3) Manganese			
(4) Carbon Dioxide			
(5) Alkalinity			
(6) Chloride			
Headspace		-1.9 ppm	relative to background
BTEX via IA.		< 100 ppb	

Additional Comments: _____

OTHER COMMENTS: _____

GROUNDWATER SAMPLING RECORD

MONITORING WELL ID: FOT TW01

SAMPLING LOCATION: Eaker AFB - Former Military Gas Station (Job#: 734786.03000)

DATE AND TIME OF SAMPLING: 6/19/99, 1999 1110 (a.m.) p.m.

SAMPLE COLLECTED BY: : JPT of Parsons ES

WEATHER: cloudy, mid 70's

1. [✓] **MONITORING WELL CONDITION:** NA, screenpoint 29-33'
   - [ ] Locked [ ] Unlocked
   - Well Number: [ ] Is Apparent [ ] Is Not Apparent. Explain: _____
   - Steel Casing Condition Is: _____
   - Inner PVC Condition Is: _____
   - [ ] Deficiencies Corrected By Sample Collector
   - [ ] Monitoring Well Required Repair (Describe): _____

2. [✓] **PRODUCT INFORMATION:** NA/NM
   - [ ] Product Observed At Depth Of _____ Feet Below Datum With _____
   - [ ] Product Not Observed

3. [✓] **WATER LEVEL:** NA/NM
   - [ ] Water Depth Measured At _____ Feet Below Datum _____ With _____
   - [ ] Other. Explain: _____

4. [✓] **MONITORING WELL EVACUATION:**
   - Method: peristaltic pump
   - Other, Describe: _____

5. [ ] **ON-SITE MEASUREMENTS:**

[✓] DIRECT INSTRUMENT READINGS

Time	1045	1055	1105				Measured With
Temp (°C)	21.3	20.3	20.7				
pH	6.30	6.46	6.52				
Cond (µS/cm)	456.7	451.5	451.2				
Do (mg/L)	0.59	0.41	0.38				
Redox (mv)	114.2	39.1	3.4				
gallons purged ~	4	5.5	7.5				

Additional Comments: _____

[✓] FIELD CHEMISTRY RESULTS (See "Field Chemistry" Item #9)

[ ] NOT PERFORMED, EXPLAIN: _____

6. [✓] **MONITORING WELL EVACUATION OBSERVATIONS:**
   - Final Water Level: _____ Feet Below Datum _____
   - Final Observations:
     - Water (slightly - very) cloudy
     - Water level (rose - fell - no change)
     - Volume Removed: 8.5 gal
     - Water odors/comments: No odor / sheen
     - Other Comments: _____

Groundwater Sampling Record

MONITORING WELL No. TW01L (Cont'd)

7. [√] **SAMPLE CONTAINERS:**

TIME SAMPLE COLLECTED: 1110 **DATE SAMPLE COLLECTED:** 6/19/99

DUPLICATE COLLECTED: YES/(NO)

DUPLICATE ID: _____ DUPLICATE SAMPLE TIME: _____

Quantity	Container Size	Container Type	Analysis	Preservative Type	Preservative Field/Lab	Filter Y/N
3	40mL	Glass VOA	BTEX/MTBE	HCl	pre	N

Sample Extraction Method: _____

8. [ ] **CONTAINER HANDLING:**

- [√] Container Sides Labeled
- [ ] Container Lids Taped
- [√] Containers Placed in Ice Chest

9. [√] **FIELD CHEMISTRY RESULTS**

Analyte	Dilution?	Concentration	Observations/Notes
(1) Sulfate		34.6 mg/L	
(2) Ferrous Iron	1/10	0.80 mg/L ∴ actual conc. = 8.0 mg/L	
(3) Manganese			
(4) Carbon Dioxide			
(5) Alkalinity			
(6) Chloride			
Headspace (PID)		-0.7	relative to background
BTEX (Immuno Assay)		<100 ppb	

Additional Comments: _____

OTHER COMMENTS: _____

GROUNDWATER SAMPLING RECORD

~~MW015I~~ ~~MW015~~ TW015I

MONITORING WELL ID: ~~MW015~~ TW015I (became MW015I)

SAMPLING LOCATION: Eaker AFB - Former Military Gas Station (Job#: 734786.03000)

DATE AND TIME OF SAMPLING: 6/9, 1999 1600 a.m./p.m.

SAMPLE COLLECTED BY: : JPT of Parsons ES

WEATHER: Sunny, upper 20's

1. [✓] **MONITORING WELL CONDITION:** NA, screenpoint 40-42.5' bgs
   - [ ] Locked [ ] Unlocked
   - Well Number: [ ] Is Apparent [ ] Is Not Apparent. Explain: _____
   - Steel Casing Condition Is: _____
   - Inner PVC Condition Is: _____
   - [ ] Deficiencies Corrected By Sample Collector
   - [ ] Monitoring Well Required Repair (Describe): _____

2. [✓] **PRODUCT INFORMATION:** NA/NM
   - [ ] Product Observed At Depth Of _____ Feet Below Datum With _____
   - [ ] Product Not Observed

3. [✓] **WATER LEVEL:** NA/NM
   - [ ] Water Depth Measured At _____ Feet Below Datum _____ With _____
   - [ ] Other. Explain: _____

4. [✓] **MONITORING WELL EVACUATION:**
   - Method: peristaltic pump
   - Other, Describe: _____

5. [✓] **ON-SITE MEASUREMENTS:**

[✓] DIRECT INSTRUMENT READINGS

Time	1535	1545	1555				Measured With
Temp (°C)	21.1	20.8	20.8				
pH	6.75	7.17	6.80				
Cond (µS/cm)	665	658	654				
Do (mg/L)	0.25	0.21	0.20				
Redox (mv)	-103.7	-123.5	-103.3				
gallons purged ~	3.5	5.5	7.5				

Additional Comments: _____

[✓] FIELD CHEMISTRY RESULTS (See "Field Chemistry" Item #9)

[ ] NOT PERFORMED, EXPLAIN: _____

6. [ ] **MONITORING WELL EVACUATION OBSERVATIONS:**
   - Final Water Level: _____ Feet Below Datum _____
   - Final Observations:
     - Water (slightly - very) cloudy moderate
     - Water level (rose - fell - no change)
     - Volume Removed: ~8-8.5 gal
     - Water odors/comments: slight/moderate odor (fuel) & oily sheen
     - Other Comments: _____

Groundwater Sampling Record

MONITORING WELL No. TW 015 (Cont'd)

7. [ ] SAMPLE CONTAINERS:

TIME SAMPLE COLLECTED: 1600 **DATE SAMPLE COLLECTED:** 6/19/99

DUPLICATE COLLECTED: YES/NO

DUPLICATE ID: _____ DUPLICATE SAMPLE TIME: _____

Quantity	Container Size	Container Type	Analysis	Preservative Type	Preservative Field/Lab	Filter Y/N
3	40mL	Glass VOA	BTEX/MTBE	HCl	pre	N

Sample Extraction Method: _____

8. [√] CONTAINER HANDLING:

- [√] Container Sides Labeled
- [ ] Container Lids Taped
- [√] Containers Placed in Ice Chest

9. [ ] FIELD CHEMISTRY RESULTS

Analyte	Dilution?	Concentration	Observations/Notes
(1) Sulfate		0.9 mg/L	
(2) Ferrous Iron	X10	2.72 mg/L ∴ actual = 27.2 mg/L	} filtered with 0.45 μ filter
(3) Manganese			
(4) Carbon Dioxide			
(5) Alkalinity			
(6) Chloride			
Headspace (PID)		20.0 ppb	
BTEX via Immunoassay (ppb)		100 < sample < 500	

Additional Comments: _____

OTHER COMMENTS: _____

TW015Q (bedrock well)
~~MW015Q~~
~~TW01G~~
~~MW01G~~

GROUNDWATER SAMPLING RECORD

MONITORING WELL ID: ~~MW01G~~

SAMPLING LOCATION: Eaker AFB - Former Military Gas Station (Job#: 734786.03000)
DATE AND TIME OF SAMPLING: 6/20, 1999 1440 a.m./p.m.
SAMPLE COLLECTED BY: : JPT of Parsons ES
WEATHER: upper 80's ≤ partly overcast

1. [√] **MONITORING WELL CONDITION:** NA, screenpoint from 61'-65' bgs
   [ ] Locked [ ] Unlocked
   Well Number: [ ] Is Apparent [ ] Is Not Apparent. Explain:
   Steel Casing Condition Is:
   Inner PVC Condition Is:
   [ ] Deficiencies Corrected By Sample Collector
   [ ] Monitoring Well Required Repair (Describe):

2. [√] **PRODUCT INFORMATION:** NA/NM
   [ ] Product Observed At Depth Of _____ Feet Below Datum With _____
   [ ] Product Not Observed

3. [√] **WATER LEVEL:** NA/NM
   [ ] Water Depth Measured At _____ Feet Below Datum _____
   With _____
   [ ] Other. Explain:

4. [√] **MONITORING WELL EVACUATION:**
   Method: peristaltic pump
   Other, Describe:

5. [√] **ON-SITE MEASUREMENTS:**
   [ ] DIRECT INSTRUMENT READINGS

Time	~~1420~~	1430	1435				Measured With
Temp (°C)	23.1	23.1	22.8				
pH	7.26	7.27	7.28				
Cond (µS/cm)	548	545	537				
Do (mg/L)	0.29	0.27	0.25				
Redox (mv)	-119.3	-119.0	-119.2				
gallons purged	6	7	7.5				

Additional Comments:

   [ ] FIELD CHEMISTRY RESULTS (See "Field Chemistry" Item #9)
   [ ] NOT PERFORMED, EXPLAIN:

6. [ ] **MONITORING WELL EVACUATION OBSERVATIONS:**
   Final Water Level: _____ Feet Below Datum _____
   Final Observations: Water (~~slightly~~ - very) cloudy
   Water level (rose - fell - no change)
   Volume Removed: ~8.5
   Water odors/comments: very slight odor, no sheen
   Other Comments: water changed from clear to orange/red almost immediately after contact w/ air. Suspect high ferrous iron content. Will run 10x dilution. Later purge water (6 gal →) did not turn red as quickly. Run to dilution for ferrous iron.

Groundwater Sampling Record

MONITORING WELL No. MW C/5C (Cont'd)

7. [ ] **SAMPLE CONTAINERS:**

TIME SAMPLE COLLECTED: 1440 **DATE SAMPLE COLLECTED:** 6/20/99

DUPLICATE COLLECTED: YES/(NO)

DUPLICATE ID: _____ DUPLICATE SAMPLE TIME: _____

Quantity	Container Size	Container Type	Analysis	Preservative Type	Preservative Field/Lab	Filter Y/N
3	40ml	VOA	BTEX/MTBE	HCl	pre	N

Sample Extraction Method: _____

8. [ ] **CONTAINER HANDLING:**

[✓] Container Sides Labeled

[ ] Container Lids Taped

[✓] Containers Placed in Ice Chest

9. [✓] **FIELD CHEMISTRY RESULTS**

Analyte	Dilution?	Concentration	Observations/Notes
(1) Sulfate		35.9 mg/L	
(2) Ferrous Iron	1/10	1.64 mg/L. so actual conc.	= 16.4 mg/L
(3) Manganese			
(4) Carbon Dioxide			
(5) Alkalinity			
(6) Chloride			
Headspace (PID)		-0.4	relative to bkgrnd.
BTEX via I.A.		<100 ppb "J" estimated	

Additional Comments: _____

OTHER COMMENTS: _____

GROUNDWATER SAMPLING RECORD

MONITORING WELL ID: TW01S I

SAMPLING LOCATION: Eaker AFB - Former Military Gas Station (Job#: 734786.03000)

DATE AND TIME OF SAMPLING: 6/21/99, 1999 1100 a.m./p.m.

SAMPLE COLLECTED BY: : TPT of Parsons ES

WEATHER: upper 80's, sunny, ~~hot~~ humid

1. [√] **MONITORING WELL CONDITION:** Screenpoint 41-45'
   - [ ] Locked [ ] Unlocked
   - Well Number: [ ] Is Apparent [ ] Is Not Apparent. Explain:
   - Steel Casing Condition Is:
   - Inner PVC Condition Is:
   - [ ] Deficiencies Corrected By Sample Collector
   - [ ] Monitoring Well Required Repair (Describe):

2. [√] **PRODUCT INFORMATION:** N/A
   - [ ] Product Observed At Depth Of _____ Feet Below Datum With _____
   - [ ] Product Not Observed

3. [√] **WATER LEVEL:** NA
   - [ ] Water Depth Measured At _____ Feet Below Datum _____ With _____
   - [ ] Other. Explain:

4. [√] **MONITORING WELL EVACUATION:**
   - Method: peristaltic pump
   - Other, Describe:

5. [√] **ON-SITE MEASUREMENTS:**

[ ] DIRECT INSTRUMENT READINGS

Time	1035	1045	1055	1100			Measured With
Temp (°C)	20.7	20.5	20.3	20.3			
pH	5.95	6.40	6.51	6.52			
Cond (µS/cm)	306.0	300.4	298.3	297.7			
Do (mg/L)	0.24	0.17	0.14	0.13			
Redox (mv)	410.4	32.6	-6.4	-7.1			
gallons purged ~	5	#7	#9	10			

Additional Comments:

[ ] FIELD CHEMISTRY RESULTS (See "Field Chemistry" Item #9)

[ ] NOT PERFORMED, EXPLAIN:

6. [X] **MONITORING WELL EVACUATION OBSERVATIONS:**
   - Final Water Level: _____ Feet Below Datum _____
   - Final Observations: Water (slightly - very) cloudy
   - Water level (rose - fell - no change)
   - Volume Removed: ~10
   - Water odors/comments: no odor / sheen *
   - Other Comments:

* slight sheen on surface of purge water after ~1 hr.

Groundwater Sampling Record

MONITORING WELL No. TW01614.4S (Cont'd)

7. [ ] **SAMPLE CONTAINERS:**

TIME SAMPLE COLLECTED: 1100 **DATE SAMPLE COLLECTED:** 6/21/99

DUPLICATE COLLECTED: YES/(NO)

DUPLICATE ID: _____ DUPLICATE SAMPLE TIME: _____

Quantity	Container Size	Container Type	Analysis	Preservative Type	Preservative Field/Lab	Filter Y/N

Sample Extraction Method: _____

8. [✓] **CONTAINER HANDLING:**

[✓] Container Sides Labeled

[✓] Container Lids Taped

[✓] Containers Placed in Ice Chest

9. [✓] **FIELD CHEMISTRY RESULTS**

Analyte	Dilution?	Concentration	Observations/Notes
(1) Sulfate		29.3 mg/L	
(2) Ferrous Iron	10	1.64 mg/L ∴ actual value = ~~1~~ 16.41 mg/L	
(3) Manganese			
(4) Carbon Dioxide			
(5) Alkalinity			
(6) Chloride			
Headspace			PID out of cal. gas
BTEX via Immunoassay		< 100 ppb	

Additional Comments: _____

OTHER COMMENTS: _____

GROUNDWATER SAMPLING RECORD

MONITORING WELL ID: TW01(1)

SAMPLING LOCATION: Eaker AFB - Former Military Gas Station (Job#: 734786.03000)

DATE AND TIME OF SAMPLING: 6/21, 1999 1540 a.m./p.m.

SAMPLE COLLECTED BY: : JPT of Parsons ES

WEATHER: low 90's, sunny, humid

1. [ ] MONITORING WELL CONDITION: screen point 62-65' bgs

[ ] Locked [ ] Unlocked

Well Number: [ ] Is Apparent [ ] Is Not Apparent. Explain:

Steel Casing Condition Is:

Inner PVC Condition Is:

[ ] Deficiencies Corrected By Sample Collector

[ ] Monitoring Well Required Repair (Describe):

2. [ ] PRODUCT INFORMATION: NA

[ ] Product Observed At Depth Of _____ Feet Below Datum With _____

[ ] Product Not Observed

3. [ ] WATER LEVEL: NA

[ ] Water Depth Measured At _____ Feet Below Datum _____

With _____

[ ] Other. Explain:

4. [ ] MONITORING WELL EVACUATION:

Method: peristaltic pump

Other, Describe:

5. [ ] ON-SITE MEASUREMENTS:

[✓] DIRECT INSTRUMENT READINGS

Time	1520	~~1525~~ 1550	1530				Measured With
Temp (°C)	~~33.2~~	~~33.7~~	~~33.6~~				probe not in water
pH	NM	NM	NM				
Cond (µS/cm)	NM	NM	NM				
Do (mg/L)	0.34	7.30	0.26				
Redox (mv)	~~-87.3~~	~~96.5~~	~~96.1~~				probe not connected
gallons purged ~	3	3.5	4.0				

Additional Comments:

[ ] FIELD CHEMISTRY RESULTS (See "Field Chemistry" Item #9)

[✓] NOT PERFORMED, EXPLAIN: grab samples for lab

6. [ ] MONITORING WELL EVACUATION OBSERVATIONS:

Final Water Level: _____ Feet Below Datum _____

Final Observations:

Water (slightly - very) cloudy

Water level (rose - fell - no change)

Volume Removed: ~5 gal

Water odors/comments: no odor/sheen

Other Comments: purge water had slight odor/sheen after sitting for ~1 hr.

Groundwater Sampling Record

MONITORING WELL No. TW016D (Cont'd)

7. [√] **SAMPLE CONTAINERS:**

TIME SAMPLE COLLECTED: 1540 **DATE SAMPLE COLLECTED:** 6/21/99

DUPLICATE COLLECTED: YES (NO)

DUPLICATE ID: _____ DUPLICATE SAMPLE TIME: _____

Quantity	Container Size	Container Type	Analysis	Preservative Type	Preservative Field/Lab	Filter Y/N
3	40 mL	VOA	BTEX/MTBE	HCl	pre	N

Sample Extraction Method: _____

8. [√] **CONTAINER HANDLING:**

[√] Container Sides Labeled

[√] Container Lids Taped

[√] Containers Placed in Ice Chest

9. [ ] **FIELD CHEMISTRY RESULTS**

Analyte	Dilution?	Concentration	Observations/Notes
(1) Sulfate			
(2) Ferrous Iron			
(3) Manganese			
(4) Carbon Dioxide			
(5) Alkalinity			
(6) Chloride			
BTEX via Immunoassay		<100 ppb	

Additional Comments: _____

OTHER COMMENTS: _____

GROUNDWATER SAMPLING RECORD

(became MW017)

MONITORING WELL ID: ~~TW017~~

SAMPLING LOCATION: Eaker AFB - Former Military Gas Station (Job#: 734786.03000)

DATE AND TIME OF SAMPLING: 6/21, 1999 1820 a.m./p.m.

SAMPLE COLLECTED BY: : JPT of Parsons ES

WEATHER: low 90's, sunny, hot

1. [✓] **MONITORING WELL CONDITION:** NA, screenpoint 40-45' bgs

[ ] Locked [ ] Unlocked

Well Number: [ ] Is Apparent [ ] Is Not Apparent. Explain: _____

Steel Casing Condition Is: _____

Inner PVC Condition Is: _____

[ ] Deficiencies Corrected By Sample Collector

[ ] Monitoring Well Required Repair (Describe): _____

2. [✓] **PRODUCT INFORMATION:** NA

[ ] Product Observed At Depth Of _____ Feet Below Datum With _____

[ ] Product Not Observed

3. [✓] **WATER LEVEL:** NA

[ ] Water Depth Measured At _____ Feet Below Datum _____

With _____

[ ] Other. Explain: _____

4. [✓] **MONITORING WELL EVACUATION:**

Method: Peristaltic pump

Other, Describe: _____

5. [ ] **ON-SITE MEASUREMENTS:**

[ ] DIRECT INSTRUMENT READINGS

Time	1755	1800	1805	1810	1815		Measured With
Temp (°C)	21.2	20.9	20.7	20.5	20.4		
pH	NM	NM	NM	NM	NM		
Cond (µS/cm)	NM	NM	NM	NM	NM		
Do (mg/L)	0.39	0.29	0.27	0.25	0.25		
Redox (mv)	93.2	56.6	30.6	24.1	20.1		
gallons purged ~	3	4	5.25	6	6.5		

Additional Comments: _____

[ ] FIELD CHEMISTRY RESULTS (See "Field Chemistry" Item #9)

[ ] NOT PERFORMED, EXPLAIN: _____

6. [ ] **MONITORING WELL EVACUATION OBSERVATIONS:**

Final Water Level: _____ Feet Below Datum _____

Final Observations: Water (slightly) very) cloudy

Water level (rose - fell - no change)

Volume Removed: ~7 gal.

Water odors/comments: No odor/sheen

Other Comments: _____

Groundwater Sampling Record

MONITORING WELL No. TW01-I (Cont'd)

7. [ ] SAMPLE CONTAINERS:

TIME SAMPLE COLLECTED: 6/7/04 **DATE SAMPLE COLLECTED:** 1820

DUPLICATE COLLECTED: YES (NO)

DUPLICATE ID: _____ DUPLICATE SAMPLE TIME: _____

Quantity	Container Size	Container Type	Analysis	Preservative Type	Preservative Field/Lab	Filter Y/N

Sample Extraction Method: _____

_____

8. [ ] CONTAINER HANDLING:

[ ] Container Sides Labeled

[ ] Container Lids Taped

[ ] Containers Placed in Ice Chest

9. [ ] FIELD CHEMISTRY RESULTS

Analyte	Dilution?	Concentration	Observations/Notes
(1) Sulfate	—	29.7 mg/L	
(2) Ferrous Iron	—	3.59 mg/L	
(3) Manganese			
(4) Carbon Dioxide			
(5) Alkalinity			
(6) Chloride			
BTEX via Immunoassay		100-500ppb / <100ppb	first analysis was rerun due to analysis probs. for

Additional Comments: _____

_____

_____

OTHER COMMENTS: _____

_____

_____

_____

GROUNDWATER SAMPLING RECORD

MONITORING WELL ID: TW9'8

SAMPLING LOCATION: Eaker AFB - Former Military Gas Station (Job#: 734786.03000)

DATE AND TIME OF SAMPLING: 6/22, 1999 1045 a.m./p.m.

SAMPLE COLLECTED BY: : JPT of Parsons ES

WEATHER: Sunny, humid, upper 70's

1. [✓] **MONITORING WELL CONDITION:** screenpoint 41'-45'
   - [ ] Locked [ ] Unlocked
   - Well Number: [ ] Is Apparent [ ] Is Not Apparent. Explain: _____
   - Steel Casing Condition Is: _____
   - Inner PVC Condition Is: _____
   - [ ] Deficiencies Corrected By Sample Collector
   - [ ] Monitoring Well Required Repair (Describe): _____

2. [✓] **PRODUCT INFORMATION:** NM/NA
   - [ ] Product Observed At Depth Of _____ Feet Below Datum With _____
   - [ ] Product Not Observed

3. [✓] **WATER LEVEL:** NM/NA
   - [ ] Water Depth Measured At _____ Feet Below Datum _____ With _____
   - [ ] Other. Explain: _____

4. [✓] **MONITORING WELL EVACUATION:**
   - Method: Centrifugal pump
   - Other, Describe: _____

5. [✓] **ON-SITE MEASUREMENTS:**

[✓] DIRECT INSTRUMENT READINGS

Time	1025	1035	1040	1045			Measured With
Temp (°C)	20.3	19.5	~~19~~ 19.6	19.4			
pH	NM	NM	NM	NM			
Cond (µS/cm)	NM	NM	NM	NM			
Do (mg/L)	0.18	0.18	0.18	0.17			
Redox (mv)	-26.7	-40.2	-46.6	-57.9			
gallons purged	5.5	7	8	9			

Additional Comments: _____

[✓] FIELD CHEMISTRY RESULTS (See "Field Chemistry" Item #9)

[ ] NOT PERFORMED, EXPLAIN: _____

6. [✓] **MONITORING WELL EVACUATION OBSERVATIONS:**
   - Final Water Level: _____ Feet Below Datum _____
   - Final Observations:
     - Water (slightly - very) cloudy
     - Water level (rose - fell - no change)
     - Volume Removed: ~9.5 gal
     - Water odors/comments: no odor/sheen
     - Other Comments: _____

Groundwater Sampling Record

MONITORING WELL No. TW01&I (Cont'd)

7. [√] **SAMPLE CONTAINERS:**

TIME SAMPLE COLLECTED: 1045 **DATE SAMPLE COLLECTED:** ~~1045~~ 6/22/99

DUPLICATE COLLECTED: YES/(NO)

DUPLICATE ID: _____ DUPLICATE SAMPLE TIME: _____

Quantity	Container Size	Container Type	Analysis	Preservative Type	Preservative Field/Lab	Filter Y/N
3	40mL	VOA	BTEX/MTBE	HCl	pre	N

Sample Extraction Method: _____

8. [√] **CONTAINER HANDLING:**

[√] Container Sides Labeled

[√] Container Lids Taped

[√] Containers Placed in Ice Chest

193- sulfate the way I had been doing it to now
34- Sulfate the way Jason does it

9. [ ] **FIELD CHEMISTRY RESULTS**

Analyte	Dilution?	Concentration	Observations/Notes
(1) Sulfate	no	19.3 / 3.44	slight turbidity, filtered with 0.45µ filter
(2) Ferrous Iron	1/3	3.40 mg/L actual conc 10.2 mg/L	
(3) Manganese			
(4) Carbon Dioxide			
(5) Alkalinity			
(6) Chloride			
PID (Groundwater sample)		0.0 PPM	Background 0.7 ppm
BTEX via Immunoassay		<100 ppb	

Additional Comments: _____

OTHER COMMENTS: _____

GROUNDWATER SAMPLING RECORD

MONITORING WELL ID: TW01?

SAMPLING LOCATION: Eaker AFB - Former Military Gas Station (Job#: 734786.03000)

DATE AND TIME OF SAMPLING: 6/22, 1999 1545 a.m./p.m.

SAMPLE COLLECTED BY: : JPT of Parsons ES

WEATHER: low 100's (103°), sunny, humid

1. [√] **MONITORING WELL CONDITION:** SP 41.45'

   [ ] Locked [ ] Unlocked

   Well Number: [ ] Is Apparent [ ] Is Not Apparent. Explain:

   Steel Casing Condition Is:

   Inner PVC Condition Is:

   [ ] Deficiencies Corrected By Sample Collector

   [ ] Monitoring Well Required Repair (Describe):

2. [√] **PRODUCT INFORMATION:** NA

   [ ] Product Observed At Depth Of Feet Below Datum With

   [ ] Product Not Observed

3. [√] **WATER LEVEL:** NA

   [ ] Water Depth Measured At Feet Below Datum With

   [ ] Other. Explain:

4. [√] **MONITORING WELL EVACUATION:**

   Method: peristaltic pump

   Other, Describe:

5. [ ] **ON-SITE MEASUREMENTS:**

[ ] DIRECT INSTRUMENT READINGS

Time	1530	1540	1550	1555			Measured With
Temp (°C)	22.6	21.5	20.8	20.7			Orion 250A
pH	NM	NM	NM	NM			
Cond (µS/cm)	NM	NM	NM	NM			
Do (mg/L)	0.30	0.18	0.16	0.16			YSI 85
Redox (mv)	-35.4	-72.9	-83.7	-80.4			Orion 250A
gallons purged ~	2	4	6	7			

Additional Comments:

[√] FIELD CHEMISTRY RESULTS (See "Field Chemistry" Item #9)

[ ] NOT PERFORMED, EXPLAIN:

6. [ ] **MONITORING WELL EVACUATION OBSERVATIONS:**

   Final Water Level: Feet Below Datum

   Final Observations: Water (slightly - very) cloudy

   Water level (rose - fell - no change) NM

   Volume Removed: ~ 7.5

   Water odors/comments: No odor / sheen

   Other Comments:

Groundwater Sampling Record

MONITORING WELL No. TWC19I (Cont'd)

7. [ ] **SAMPLE CONTAINERS:**

TIME SAMPLE COLLECTED: 1555 **DATE SAMPLE COLLECTED:** 6/22/99 ~~1555~~

DUPLICATE COLLECTED: YES/NO

DUPLICATE ID: _____ DUPLICATE SAMPLE TIME: _____

Quantity	Container Size	Container Type	Analysis	Preservative Type	Preservative Field/Lab	Filter Y/N
3	40mL	VOA	BTEX/MTBE	HCl	pre.	N

Sample Extraction Method: _____

8. [ ] **CONTAINER HANDLING:**

- [ ] Container Sides Labeled
- [ ] Container Lids Taped
- [ ] Containers Placed in Ice Chest

9. [✓] **FIELD CHEMISTRY RESULTS**

Analyte	Dilution?	Concentration	Observations/Notes
(1) Sulfate	NO	3.3 mg/L*; 25.1**	slight white turb.
(2) Ferrous Iron	Yes - 10mL GW & 30mL Total;	4.40 x 3 = 13.2	Dark Rust color, no turb.
(3) Manganese			
(4) Carbon Dioxide			
(5) Alkalinity			
(6) Chloride			
Headspace		-0.6 ppm	relative to background (-0.2 ppm)
BTEX via Immunoassay		< 100 ppb	

Additional Comments: Sample Filtered w/ In line Filter prior to Sampling.

* ; calibrated and zeroed w/ sample groundwater,

** ; calibrated w/ DI water, not zeroed.

OTHER COMMENTS: IPT method ferrous iron = 14.64 mg/L

4.2

GROUNDWATER SAMPLING RECORD

(became MW16)

MONITORING WELL ID: ~~MW16~~ TW020

SAMPLING LOCATION: Eaker AFB - Former Military Gas Station (Job#: 734786.03000)

DATE AND TIME OF SAMPLING: 6/23, 1999 1130 a.m./p.m.

SAMPLE COLLECTED BY: : JPT of Parsons ES

WEATHER: rainy, mid-70's

1. [✓] **MONITORING WELL CONDITION:** SP 30-34' bgs, NA

[ ] Locked [ ] Unlocked

Well Number: [ ] Is Apparent [ ] Is Not Apparent. Explain:

Steel Casing Condition Is:

Inner PVC Condition Is:

[ ] Deficiencies Corrected By Sample Collector

[ ] Monitoring Well Required Repair (Describe):

2. [✓] **PRODUCT INFORMATION:** NA

[ ] Product Observed At Depth Of _____ Feet Below Datum With _____

[ ] Product Not Observed

3. [✓] **WATER LEVEL:** NA

[ ] Water Depth Measured At _____ Feet Below Datum _____

With _____

[ ] Other. Explain:

4. [✓] **MONITORING WELL EVACUATION:**

Method: peristaltic pump

Other, Describe:

5. [ ] **ON-SITE MEASUREMENTS:**

[ ] DIRECT INSTRUMENT READINGS

Time	1105	1120	1125				Measured With
Temp (°C)	20.7	20.5	20.4				
pH							
Cond (µS/cm)							
Do (mg/L)	0.14	0.16	0.15				
Redox (mv)	33.8	-9.5 -12.6	-14.5				
gallons purged	5	7	8				

Additional Comments:

[ ] FIELD CHEMISTRY RESULTS (See "Field Chemistry" Item #9)

[ ] NOT PERFORMED, EXPLAIN:

6. [ ] **MONITORING WELL EVACUATION OBSERVATIONS:**

Final Water Level: _____ Feet Below Datum _____

Final Observations: Water (slightly - very) cloudy

Water level (rose - fell - no change)

Volume Removed: ~ 8.5 gal

Water odors/comments: ~~slt~~ no odor/sheen

Other Comments:

Groundwater Sampling Record

MONITORING WELL No. [illegible]16 (Cont'd)

7. [ ] **SAMPLE CONTAINERS:** no lab analysis

TIME SAMPLE COLLECTED: _____ **DATE SAMPLE COLLECTED:** _____

DUPLICATE COLLECTED: YES/NO

DUPLICATE ID: _____ DUPLICATE SAMPLE TIME: _____

Quantity	Container Size	Container Type	Analysis	Preservative Type	Preservative Field/Lab	Filter Y/N

Sample Extraction Method: _____

8. [ ] **CONTAINER HANDLING:** No lab analysis

- [ ] Container Sides Labeled
- [ ] Container Lids Taped
- [ ] Containers Placed in Ice Chest

9. [ ] **FIELD CHEMISTRY RESULTS**

Analyte	Dilution?	Concentration	Observations/Notes
(1) Sulfate			
(2) Ferrous Iron			
(3) Manganese			
(4) Carbon Dioxide			
(5) Alkalinity			
(6) Chloride			
Headspace (PID)		~0.8 ppm	relative to background (2.2 ppm)
BTEX via EA		<100 ppb	

Additional Comments: _____

OTHER COMMENTS: _____

FIELD SAMPLING REPORT

Location: MW016 PROJECT: Eaker AFB Former Mil Gas Stat

SITE:

SAMPLE INFORMATION

MATRIX: Soil SAMPLE ID: 074-SB010-015

SAMPLING METHOD: Split spoon DUP./REP. OF: —

BEGINNING DEPTH: 28' MATRIX SPIKE/MATRIX SPIKE DUPLICATE

END DEPTH: 33' YES ( ) NO ( )

GRAB (X) COMPOSITE ( ) DATE: 6/23/99 TIME: 1300

CONTAINER SIZE/TYPE	#	PRESERVATION/ PREPARATION	EXTRACTION METHOD	ANALYTICAL METHOD	ANALYSIS
Glass	1	cool			TOC

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st 0.6	COLOR: light brown-gray	
2nd	ODOR: none	
	OTHER:	

GENERAL INFORMATION

WEATHER: SUN/CLEAR ____ OVERCAST/RAIN X WIND DIRECTION ____ AMBIENT TEMP low 90's

SHIPMENT VIA: FED-X X HAND DELIVER ____ COURIER ____ OTHER ____

SHIPPED TO: Quanterra

COMMENTS:

SAMPLER: JPT OBSERVER

MATRIX CODES

DC=DRILL CUTTINGS
WG=GROUNDWATER
LH=HAZARDOUS LIQUID WASTE
SH=HAZARDOUS SOLID WASTE
SE=SEDIMENT
SL=SLUDGE
SO=SOIL
GS=SOIL GAS
WS=SURFACE WATER
SW=SWAB/WIPE

SAMPLING METHOD CODES

B=BAILER
BR=BRASS RING
CS=COMPOSITE SAMPLE
C=CONTINUOUS FLIGHT AUGER
DT=DRIVEN TUBE
W=SWAB/WIPE
G=GRAB
HA=HAND AUGER
H=HOLLOW STEM AUGER
HP=HYDRO PUNCH
SS=SPLIT SPOON
SP=SUBMERSIBLE PUMP

AFCEE FORM SR.0

FIELD SAMPLING REPORT

Location: Eaker AFB PROJECT: Eaker - Former Mil Gas Stat

SITE: TW017 (To be MW017)

SAMPLE INFORMATION

MATRIX soil SAMPLE ID: 074-SB017-021

SAMPLING METHOD split spoon DUP./REP. OF:

BEGINNING DEPTH 43' MATRIX SPIKE/MATRIX SPIKE DUPLICATE

END DEPTH 48' YES ( ) NO (X)

GRAB (X) COMPOSITE ( ) DATE: 6/23/99 TIME: 1710

CONTAINER SIZE/TYPE	#	PRESERVATION/ PREPARATION	EXTRACTION METHOD	ANALYTICAL METHOD	ANALYSIS
Glass wide	1	cool/ice			TOC

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st	COLOR:	
2nd	ODOR:	
	OTHER:	

GENERAL INFORMATION

WEATHER: SUN/CLEAR ____ OVERCAST/RAIN X WIND DIRECTION ____ AMBIENT TEMP 80

SHIPMENT VIA: FED-X X HAND DELIVER ____ COURIER ____ OTHER ____

SHIPPED TO: Quanterra

COMMENTS: Boring to become downgradient well MW017, only ~2.5' of recovery

SAMPLER: JPT OBSERVER ____

MATRIX CODES

DC=DRILL CUTTINGS
WG=GROUNDWATER
LH=HAZARDOUS LIQUID WASTE
SH=HAZARDOUS SOLID WASTE
SE=SEDIMENT
SL=SLUDGE
SO=SOIL
GS=SOIL GAS
WS=SURFACE WATER
SW=SWAB/WIPE

SAMPLING METHOD CODES

B=BAILER
BR=BRASS RING
CS=COMPOSITE SAMPLE
C=CONTINUOUS FLIGHT AUGER
DT=DRIVEN TUBE
W=SWAB/WIPE
G=GRAB
HA=HAND AUGER
H=HOLLOW STEM AUGER
HP=HYDRO PUNCH
SS=SPLIT SPOON
SP=SUBMERSIBLE PUMP

AFCEE FORM SR.0

FIELD SAMPLING REPORT

Location: Eaker AFB PROJECT: Eaker Former Mil Gas Stat.

SITE: TW017 / MW017

SAMPLE INFORMATION

MATRIX Soil SAMPLE ID: 074-SB017-02H

SAMPLING METHOD Spl-t spoon DUP./REP. OF:

BEGINNING DEPTH 6/8 MATRIX SPIKE/MATRIX SPIKE DUPLICATE

END DEPTH 5' YES ( ) NO ( )

GRAB ( ) COMPOSITE ( ) DATE: 6/23/94 TIME: 1420

CONTAINER SIZE/TYPE	#	PRESERVATION/ PREPARATION	EXTRACTION METHOD	ANALYTICAL METHOD	ANALYSIS
Glass Pint	1	ice			TOC

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st	COLOR:	
2nd	ODOR:	
	OTHER:	

GENERAL INFORMATION

WEATHER: SUN/CLEAR ____ OVERCAST/RAIN X WIND DIRECTION ____ AMBIENT TEMP 75

SHIPMENT VIA: FED-X X HAND DELIVER ____ COURIER ____ OTHER ____

SHIPPED TO: Quanterra

COMMENTS: only ~0.5' of recovery

SAMPLER: JPT OBSERVER ____

MATRIX CODES

DC=DRILL CUTTINGS
WG=GROUNDWATER
LH=HAZARDOUS LIQUID WASTE
SH=HAZARDOUS SOLID WASTE
SE=SEDIMENT
SL=SLUDGE
SO=SOIL
GS=SOIL GAS
WS=SURFACE WATER
SW=SWAB/WIPE

SAMPLING METHOD CODES

B=BAILER
BR=BRASS RING
CS=COMPOSITE SAMPLE
C=CONTINUOUS FLIGHT AUGER
DT=DRIVEN TUBE
W=SWAB/WIPE
G=GRAB
HA=HAND AUGER
H=HOLLOW STEM AUGER
HP=HYDRO PUNCH
SS=SPLIT SPOON
SP=SUBMERSIBLE PUMP

AFCEE FORM SR.0

APPENDIX C

AQUIFER SLUG TEST ANALYSIS INPUT AND OUTPUT

PHASE II

Client: **AFCEE**

Project: **Eaker AFB**

Project No.: **734786/04000**

Well No.: **MW-3**

Test Date:

Formation Tested:

Rising (R) or Falling (F) Head Test: **rising**

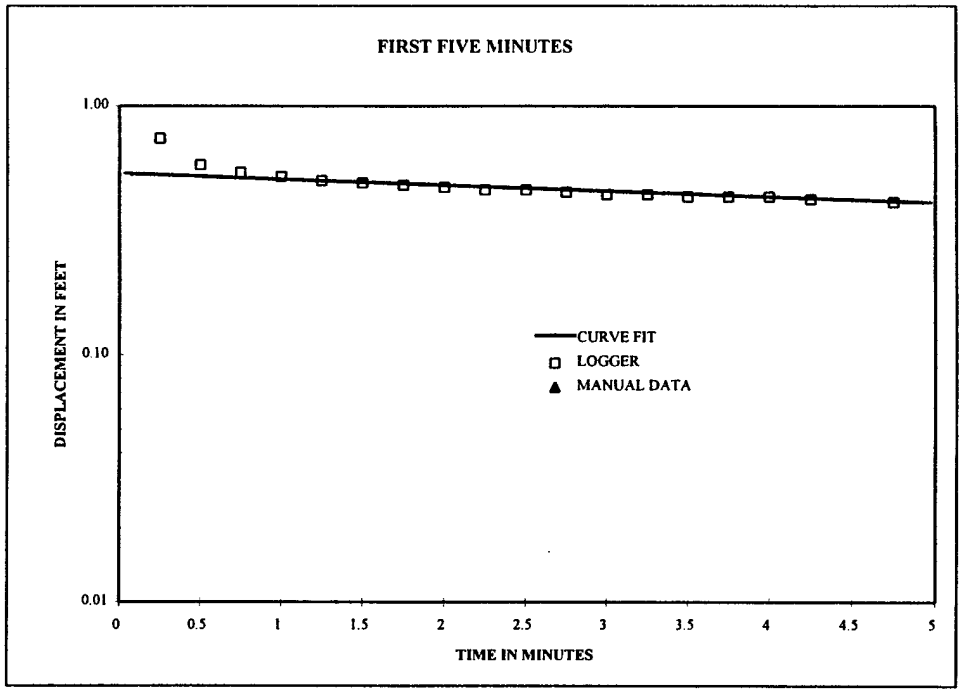
Logger Data File:

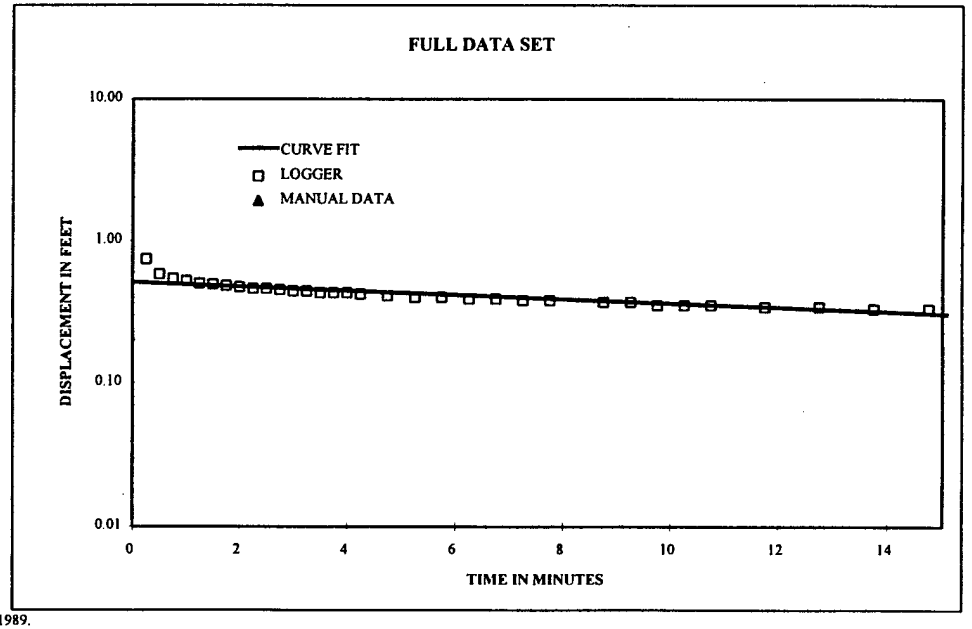
Hydraulic conductivity	1.03E-04	cm/sec
	2.03E-04	ft/min
	0.29	ft/day

Casing stickup	-0.18	feet
Static water level (from top of casing)	7.69	feet
Depth to bottom of screen (from ground level)	13.68	feet
Boring diameter	8.00	inches
Casing diameter	2.00	inches
Screen diameter	2.00	inches
Screen length	7.50	feet
Depth to "impermeable boundary"	23.00	feet
Porosity of filter pack	0.30	
Slug diameter (optional)		inches
Slug length (optional)		feet
Theoretical ΔH at time zero (Y_0)	0.00	feet
Actual ΔH at time zero (Y_0)	0.510	feet
ΔH at time t (Y_t)	0.010	feet
Time	115.00	min

Bouwer-Rice Parameters

feet	cm		cm	
7.87	239.88	*SW*		
5.81	177.09	*H*	17.43	*L/Rw*
6.18	188.37	*Ts*	0.38	*H/D*
0.333	10.16	*Rw*	2.00	*A*
0.195	5.96	*Rc*	0.28	*B*
0.167	5.08	*DS*	1.40	*C*
5.81	177.09	*L*	3.33	*Ln[(D-H)/Rw]'*
15.13	461.16	*D*	3.33	*Ln[(D-H)/Rw]*
0.51	15.54	Y_0	1.81	equation (8)
0.01	0.30	Y_t	2.15	equation (9)
	6900.00	*t (seconds)*	1.81	*Ln(Re/Rw)*
	0.30	*n*	1.0E-04	equation (5)





Bouwer, Herman. 1989. "The Bouwer and Rice Slug Test - An Update". Ground Water vol. 27, no. 3, May-June 1989.

Bouwer, H. and R.C. Rice. 1976. A Slug Test for Determining Hydraulic Conductivity of Unconfined Aquifers With Completely or Partially Penetrating Wells". Water Resources Research vol 12, no. 3, June 1976.

Client: **AFCEE**

Project: **Eaker AFB**

Project No.: **734786/04000**

Well No.: **MW-6**

Test Date:

Formation Tested:

Rising (R) or Falling (F) Head Test: **rising**

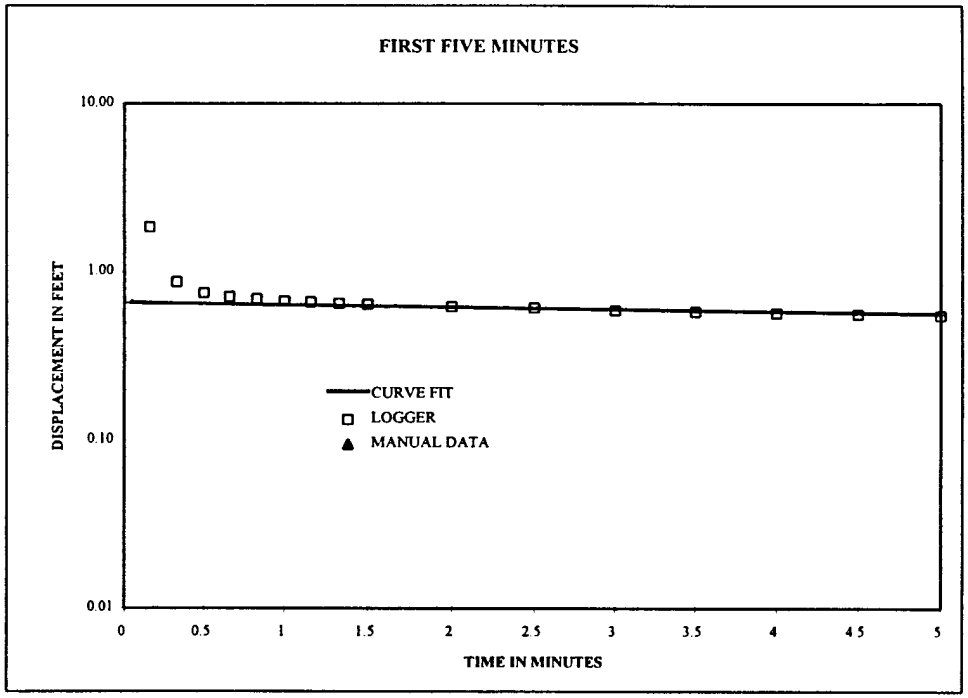
Logger Data File:

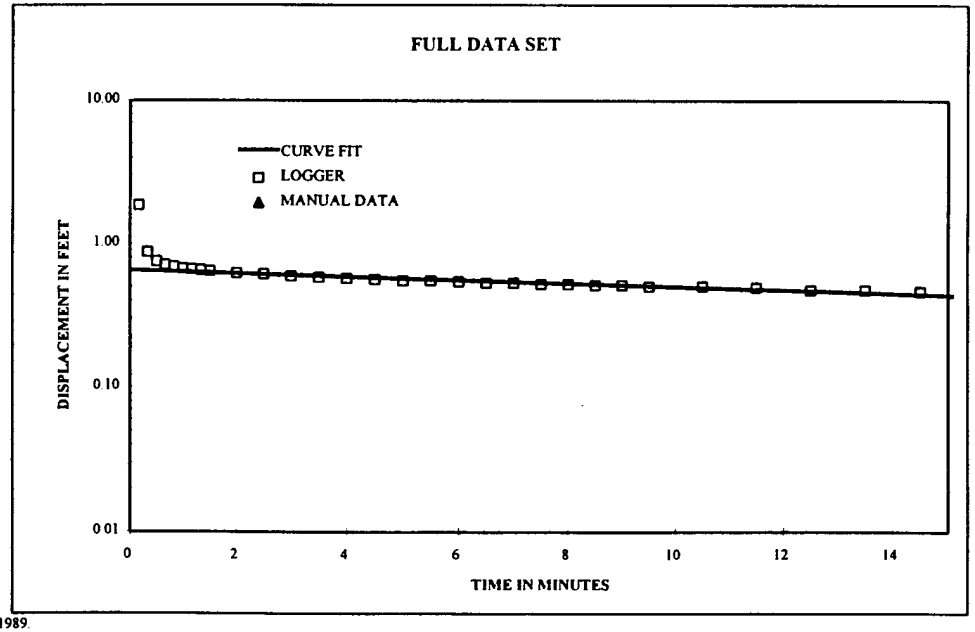
Hydraulic conductivity **1.31E-05 cm/sec**
2.58E-05 ft/min
0.04 ft/day

Casing stickup	-0.36	feet
Static water level (from top of casing)	6.58	feet
Depth to bottom of screen (from ground level)	14.06	feet
Boring diameter	8.00	inches
Casing diameter	2.00	inches
Screen diameter	2.00	inches
Screen length	7.50	feet
Depth to "impermeable boundary"	23.00	feet
Porosity of filter pack	0.30	
Slug diameter (optional)		inches
Slug length (optional)		feet
Theoretical ΔH at time zero (Y_0)	0.00	feet
Actual ΔH at time zero (Y_0)	0.650	feet
ΔH at time t (Y_t)	0.010	feet
Time	155.00	min

Bouwer-Rice Parameters

feet	cm		cm	
6.94	211.53	*SW*		
7.12	217.02	*H*	21.36	*L/Rw*
6.56	199.95	*Ts*	0.44	*H/D*
0.333	10.16	*Rw*	2.20	*A*
0.083	2.54	*Rc*	0.30	*B*
0.167	5.08	*DS*	1.60	*C*
7.12	217.02	*L*	3.29	*Ln[(D-H)/Rw]'*
16.06	489.51	*D*	3.29	*Ln[(D-H)/Rw]*
0.64999999	19.81	Y_0	1.97	equation (8)
0.01	0.30	Y_t	2.30	equation (9)
	9300.00	*t (seconds)*	1.97	*Ln(Re/Rw)*
	0.30	*n*	1.3E-05	equation (5)





Bouwer, Herman. 1989. "The Bouwer and Rice Slug Test - An Update". Ground Water vol. 27, no. 3, May-June 1989.

Bouwer, H. and R.C. Rice. 1976. A Slug Test for Determining Hydraulic Conductivity of Unconfined Aquifers Wi... ...ely or Partially Penetrating Wells". Water Resources Research. vol 12, no. 3, June 1976.

Client: **AFCEE**

Project: **Eaker AFB**

Project No.: **734786/04000**

Well No.: **MW-11**

Test Date:

Formation Tested:

Rising (R) or Falling (F) Head Test: **rising**

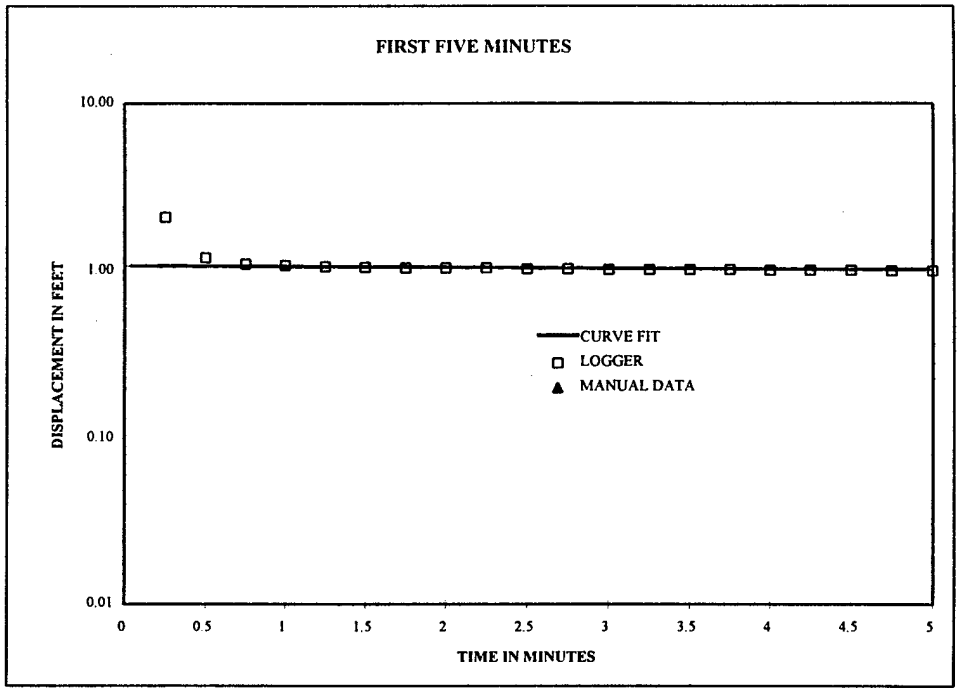
Logger Data File:

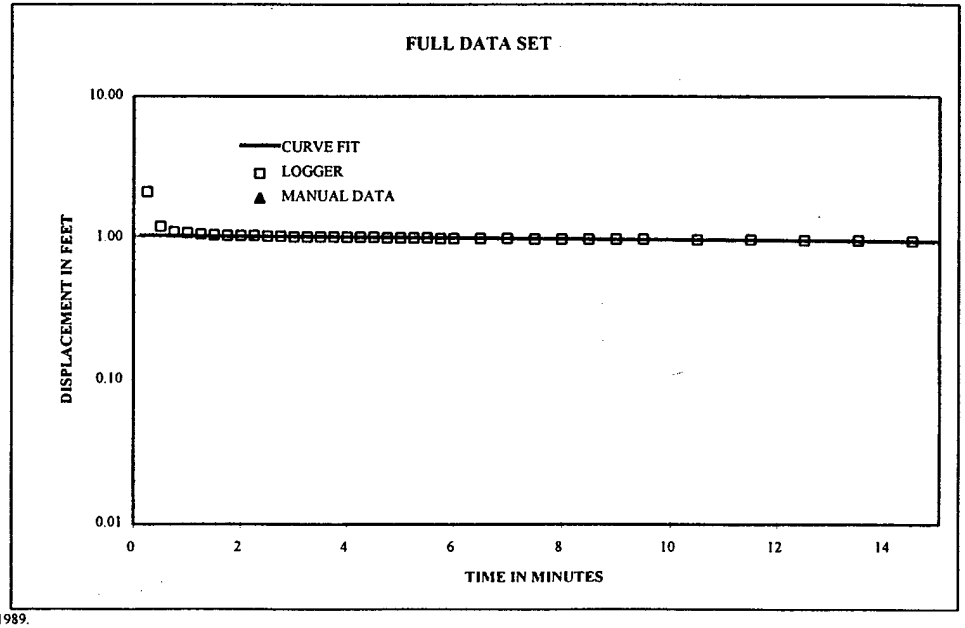
Hydraulic conductivity	3.86E-06	cm/sec
	7.59E-06	ft/min
	0.01	ft/day

Casing stickup	-0.22	feet
Static water level (from top of casing)	6.39	feet
Depth to bottom of screen (from ground level)	13.55	feet
Boring diameter	8.00	inches
Casing diameter	2.00	inches
Screen diameter	2.00	inches
Screen length	7.50	feet
Depth to "impermeable boundary"	23.00	feet
Porosity of filter pack	0.30	
Slug diameter (optional)		inches
Slug length (optional)		feet
Theoretical ΔH at time zero (Y_0)	0.00	feet
Actual ΔH at time zero (Y_0)	1.100	feet
ΔH at time t (Y_t)	0.010	feet
Time	600.00	min

Bouwer-Rice Parameters

feet	cm		cm	
6.61	201.47	*SW*		
6.94	211.53	*H*	20.82	*L/Rw*
6.05	184.40	*Ts*	0.42	*H/D*
0.333	10.16	*Rw*	2.20	*A*
0.083	2.54	*Rc*	0.30	*B*
0.167	5.08	*DS*	1.60	*C*
6.94	211.53	*L*	3.34	*Ln[(D-H)/Rw]'*
16.39	499.57	*D*	3.34	*Ln[(D-H)/Rw]*
1.1	33.53	Y_0	1.94	equation (8)
0.01	0.30	Y_t	2.28	equation (9)
	36000.00	*t (seconds)*	1.94	*Ln(Re/Rw)*
	0.30	*n*	3.9E-06	equation (5)





Bouwer, Herman. 1989. "The Bouwer and Rice Slug Test - An Update". Ground Water vol. 27, no. 3, May-June 1989.

Bouwer, H. and R.C. Rice. 1976. A Slug Test for Determining Hydraulic Conductivity of Unconfined Aquifers With Completely or Partially Penetrating Wells". Water Resources Research. vol 12, no 3, June 1976

Client: **AFCEE**

Project: **Eaker AFB**

Project No.: **734786/04000**

Well No.: **MW-12**

Test Date:

Formation Tested:

Rising (R) or Falling (F) Head Test: **rising**

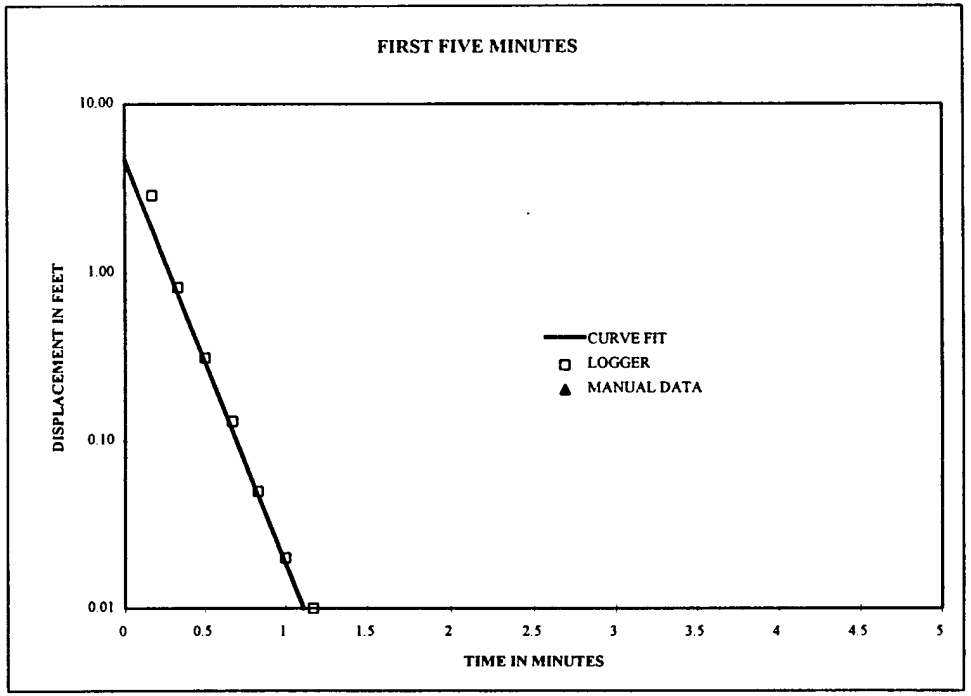
Logger Data File:

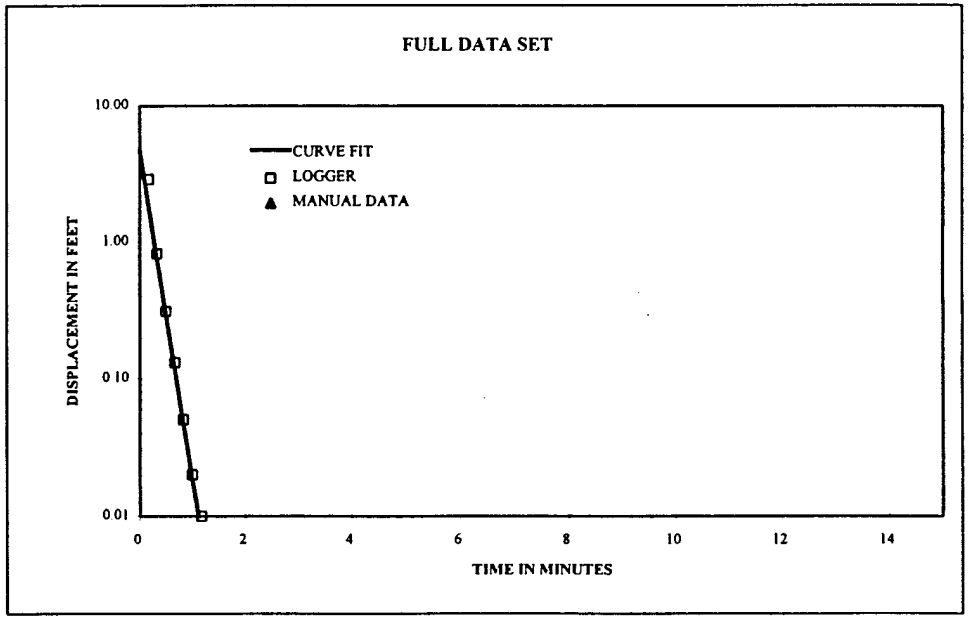
Hydraulic conductivity **4.54E-03 cm/sec**
8.94E-03 ft/min
12.88 ft/day

Casing stickup	-0.19	feet
Static water level (from top of casing)	9.02	feet
Depth to bottom of screen (from ground level)	32.79	feet
Boring diameter	8.00	inches
Casing diameter	2.00	inches
Screen diameter	2.00	inches
Screen length	7.50	feet
Depth to "impermeable boundary"	200.00	feet
Porosity of filter pack	0.30	
Slug diameter (optional)		inches
Slug length (optional)		feet
Theoretical ΔH at time zero (Y_0)	0.00	feet
Actual ΔH at time zero (Y_0)	4.600	feet
ΔH at time t (Y_t)	0.010	feet
Time	1.11	min

Bouwer-Rice Parameters

feet	cm		cm	
9.21	280.72	*SW*		
23.58	718.72	*H*	90.00	*L/Rw*
25.29	770.84	*Ts*	0.12	*H/D*
0.083	2.54	*Rw*	4.00	*A*
0.083	2.54	*Rc*	0.70	*B*
0.167	5.08	*DS*	3.75	*C*
7.50	228.60	*L*	7.60	*Ln[(D-H)/Rw]'*
190.79	5815.28	*D*	6.00	*Ln[(D-H)/Rw]*
4.60000002	140.21	Y_0	3.50	equation (8)
0.01	0.30	Y_t	4.23	equation (9)
	66.60	*t (seconds)*	3.50	*Ln(Re/Rw)*
	0.30	*n*	4.5E-03	equation (5)





Bouwer, Herman. 1989. "The Bouwer and Rice Slug Test - An Update". Ground Water vol. 27, no. 3, May-June 1989

Bouwer, H. and R.C. Rice. 1976. A Slug Test for Determining Hydraulic Conductivity of Unconfined Aquifers W[illegible]-lv
or Partially Penetrating Wells". Water Resources Research vol 12, no. 3, June 1976.

PHASE III

Well ID	Test Number	Test Type Rising (R) or Falling (F)	Hydraulic Conductivity (ft/day) Bouwer, Rice
MW13	1	F	22.60
	2	R	20.72
	3	F	21.55
	4	R	22.14
	5	F	21.39
	average		**21.7**
MW15I	3	R	58.89
	average		**58.9**
MW15D	1	R	81.85
	2	F	36.00
	3	R	48.00
	4	F	30.86
	average		**49.2**

Client: **AFCEE**

Project: **Eaker AFB Site 074**

Project No.: **734786**

Well No.: **074-MW13**

Test Date: **June 27, 1999**

Formation Tested: **Confined Sand Aquifer**

Rising (R) or Falling (F) Head Test: **Falling Head**

Logger Data File: **mw13-1**

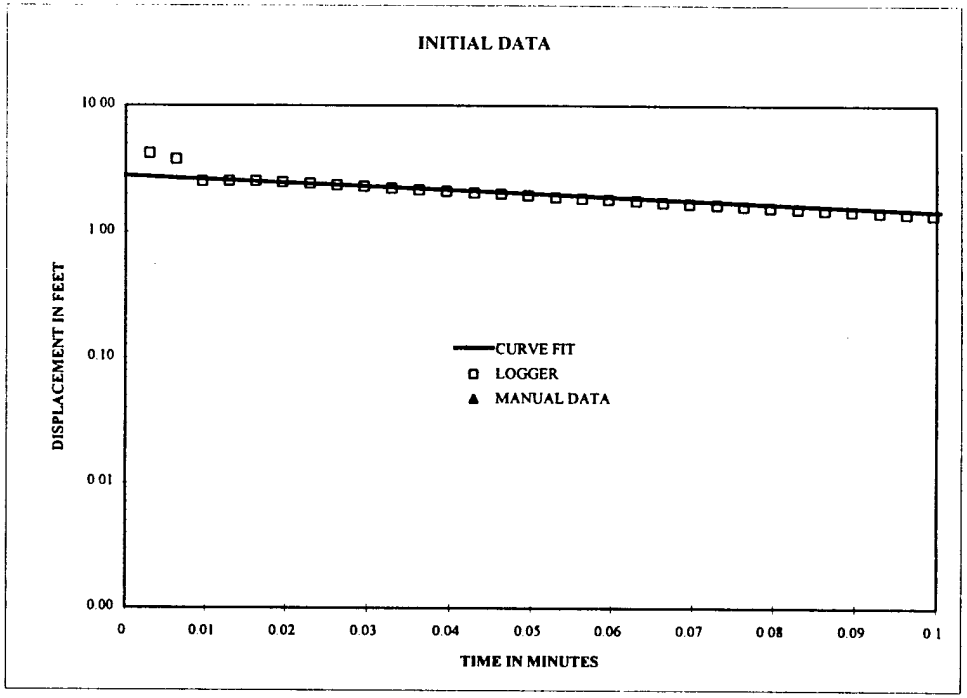
Hydraulic conductivity

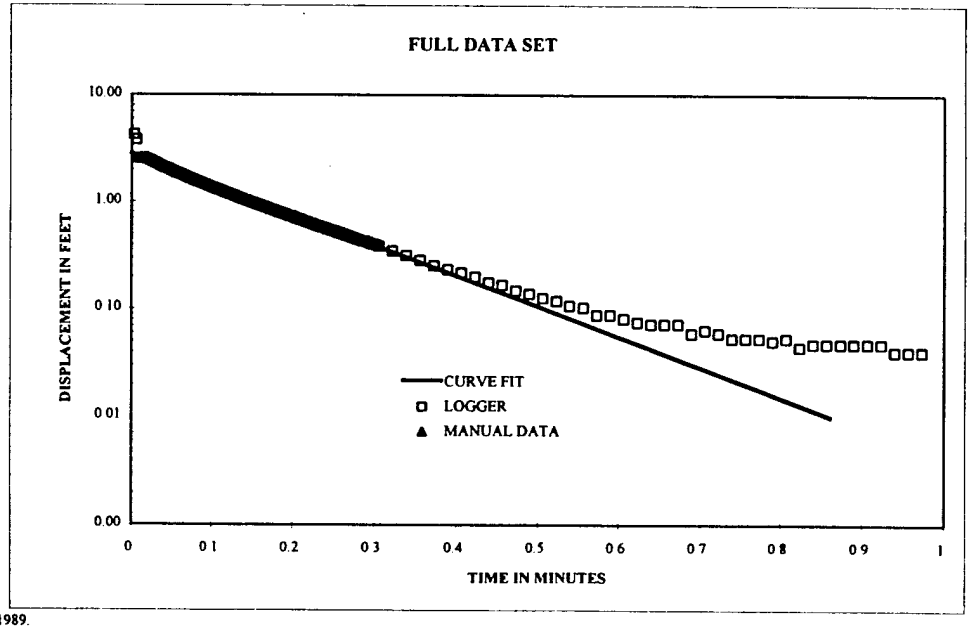
7.97E-03	cm/sec
1.57E-02	ft/min
22.60	ft/day

Casing stickup	0.00	feet
Static water level (from top of casing)	10.28	feet
Depth to bottom of screen (from ground level)	32.30	feet
Boring diameter	8.00	inches
Casing diameter	2.00	inches
Screen diameter	2.00	inches
Screen length	5.00	feet
Depth to "impermeable boundary"	40.00	feet
Porosity of filter pack		
Slug diameter (optional)	1.65	inches
Slug length (optional)	5.20	feet
Theoretical ΔH at time zero (Y_0)	3.54	feet
Actual ΔH at time zero (Y_0)	2.800	feet
ΔH at time t (Y_t)	0.010	feet
Time	0.86	min

Bouwer-Rice Parameters

feet	cm		cm	
10.28	313.33	*SW*		
22.02	671.17	*H*	60.00	*L/Rw*
27.3	832.10	*Ts*	0.74	*H/D*
0.083	2.54	*Rw*	3.30	*A*
0.083	2.54	*Rc*	0.50	*B*
0.167	5.08	*DS*	2.90	*C*
5.00	152.40	*L*	4.53	*Ln[(D-H)/Rw]'*
29.72	905.87	*D*	4.53	*Ln[(D-H)/Rw]*
2.79999997	85.34	Y_0	3.45	equation (8)
0.01	0.30	Y_t	4.07	equation (9)
	51.60	*t (seconds)*	3.45	*Ln(Re/Rw)*
	0.00	*n*	8.0E-03	equation (5)





Bouwer, Herman. 1989. "The Bouwer and Rice Slug Test - An Update". Ground Water vol. 27, no. 3, May-June 1989.

Bouwer, H. and R.C. Rice. 1976. A Slug Test for Determining Hydraulic Conductivity of Unconfined Aquifers With [illegible]ely or Partially Penetrating Wells" Water Resources Research. vol 12, no. 3, June 1976.

SE1000C
Environmental Logger
06/27 11:26

Unit# 01579 Test 9

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	00152
Reference	0.000
Linearity	0.030
Scale factor	9.970
Offset	0.020
Delay mSEC	50.000

Step 0 06/27 10:21:49

Elapsed Time	INPUT 1
0.0000	-0.760
0.0033	-0.763
0.0066	-0.763
0.0100	-0.766
0.0133	-0.305
0.0166	2.099
0.0200	3.403
0.0233	4.030
0.0266	4.509
0.0300	3.400
0.0333	2.972
0.0366	1.718
0.0400	1.733
0.0433	1.727
0.0466	1.677
0.0500	1.623
0.0533	1.547
0.0566	1.491
0.0600	1.418
0.0633	1.349
0.0666	1.295
0.0700	1.242
0.0733	1.201
0.0766	1.141
0.0800	1.084

0.0833	1.040
0.0866	1.005
0.0900	0.958
0.0933	0.914
0.0966	0.873
0.1000	0.838
0.1033	0.791
0.1066	0.753
0.1100	0.725
0.1133	0.690
0.1166	0.655
0.1200	0.627
0.1233	0.595
0.1266	0.561
0.1300	0.532
0.1333	0.504
0.1366	0.472
0.1400	0.447
0.1433	0.419
0.1466	0.394
0.1500	0.368
0.1533	0.340
0.1566	0.318
0.1600	0.293
0.1633	0.271
0.1666	0.249
0.1700	0.227
0.1733	0.204
0.1766	0.182
0.1800	0.163
0.1833	0.145
0.1866	0.122
0.1900	0.107
0.1933	0.085
0.1966	0.069
0.2000	0.047
0.2033	0.031
0.2066	0.018
0.2100	-0.003
0.2133	-0.015
0.2166	-0.031
0.2200	-0.050
0.2233	-0.069
0.2266	-0.075
0.2300	-0.094
0.2333	-0.110
0.2366	-0.123
0.2400	-0.135

0.2433	-0.148
0.2466	-0.160
0.2500	-0.176
0.2533	-0.189
0.2566	-0.201
0.2600	-0.211
0.2633	-0.224
0.2666	-0.233
0.2700	-0.246
0.2733	-0.255
0.2766	-0.268
0.2800	-0.274
0.2833	-0.287
0.2866	-0.296
0.2900	-0.305
0.2933	-0.315
0.2966	-0.324
0.3000	-0.337
0.3033	-0.343
0.3066	-0.353
0.3100	-0.362
0.3133	-0.372
0.3166	-0.375
0.3200	-0.384
0.3233	-0.394
0.3266	-0.400
0.3300	-0.406
0.3333	-0.416
0.3500	-0.454
0.3666	-0.485
0.3833	-0.517
0.4000	-0.548
0.4166	-0.567
0.4333	-0.583
0.4500	-0.602
0.4666	-0.624
0.4833	-0.633
0.5000	-0.652
0.5166	-0.662
0.5333	-0.674
0.5500	-0.681
0.5666	-0.693
0.5833	-0.697
0.6000	-0.712
0.6166	-0.712
0.6333	-0.719
0.6500	-0.725
0.6666	-0.728

0.6833	-0.728
0.7000	-0.728
0.7166	-0.741
0.7333	-0.737
0.7500	-0.741
0.7666	-0.747
0.7833	-0.747
0.8000	-0.747
0.8166	-0.750
0.8333	-0.747
0.8500	-0.756
0.8666	-0.753
0.8833	-0.753
0.9000	-0.753
0.9166	-0.753
0.9333	-0.753
0.9500	-0.753
0.9666	-0.760
0.9833	-0.760
1.0000	-0.760

Client: **AFCEE**

Project: **Eaker AFB Site 074**

Project No.: **734786**

Well No.: **074-MW13**

Test Date: **June 27, 1999**

Formation Tested: **Confined Sand Aquifer**

Rising (R) or Falling (F) Head Test: **Rising Head**

Logger Data File: **mw13-2**

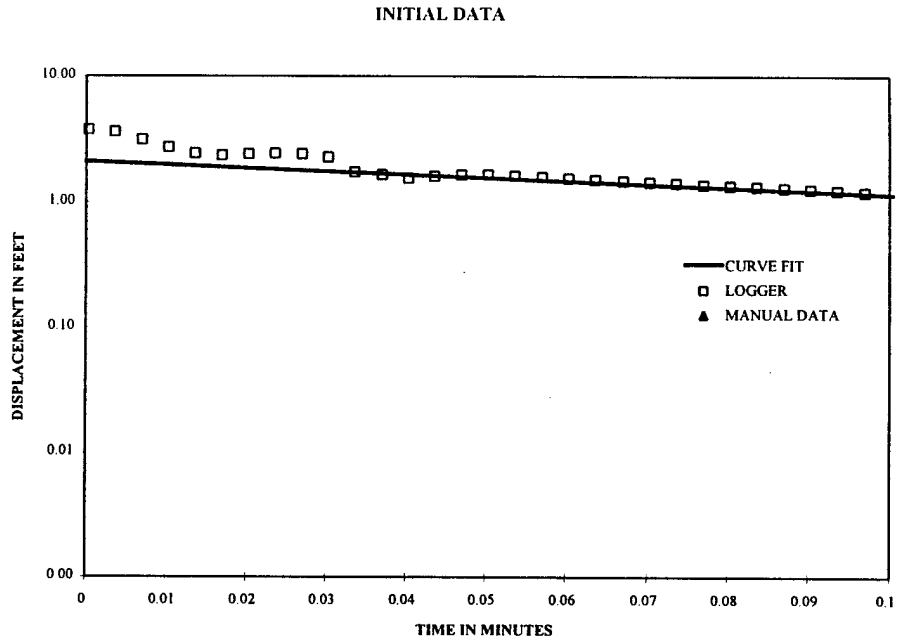
Hydraulic conductivity

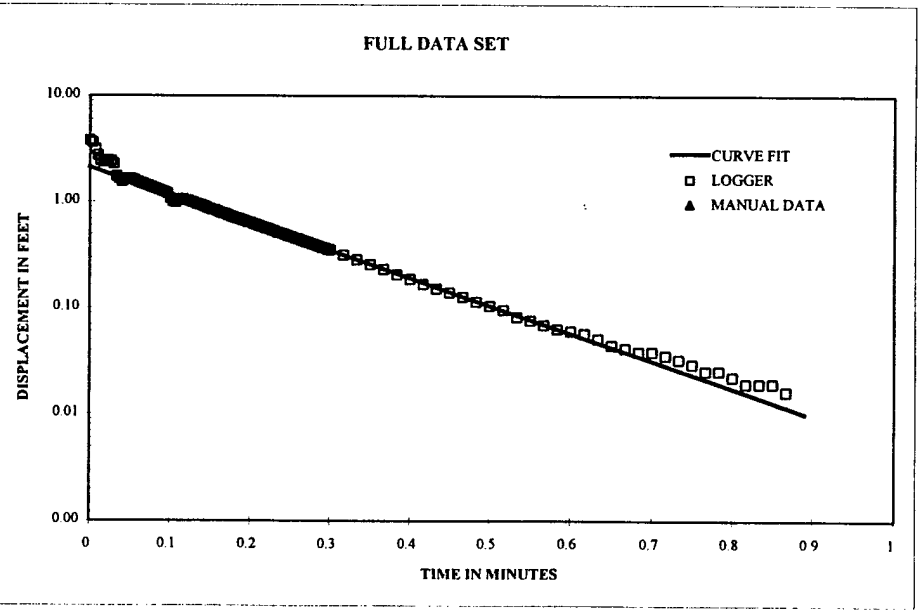
7.31E-03	cm/sec
1.44E-02	ft/min
20.72	ft/day

Casing stickup	0.00	feet
Static water level (from top of casing)	10.28	feet
Depth to bottom of screen (from ground level)	32.30	feet
Boring diameter	8.00	inches
Casing diameter	2.00	inches
Screen diameter	2.00	inches
Screen length	5.00	feet
Depth to "impermeable boundary"	40.00	feet
Porosity of filter pack		
Slug diameter (optional)	1.65	inches
Slug length (optional)	5.20	feet
Theoretical ΔH at time zero (Y_0)	3.54	feet
Actual ΔH at time zero (Y_0)	2.100	feet
ΔH at time t (Y_t)	0.010	feet
Time	0.89	min

Bouwer-Rice Parameters

feet	cm		cm	
10.28	313.33	*SW*		
22.02	671.17	*H*	60.00	*L/Rw*
27.3	832.10	*Ts*	0.74	*H/D*
0.083	2.54	*Rw*	3.30	*A*
0.083	2.54	*Rc*	0.50	*B*
0.167	5.08	*DS*	2.90	*C*
5.00	152.40	*L*	4.53	*Ln[(D-H)/Rw]'*
29.72	905.87	*D*	4.53	*Ln[(D-H)/Rw]*
2.09999996	64.01	Y_o	3.45	equation (8)
0.01	0.30	Y_t	4.07	equation (9)
	53.40	*t (seconds)*	3.45	*Ln(Re/Rw)*
	0.00	*n*	7.3E-03	equation (5)





Bouwer, Herman. 1989. "The Bouwer and Rice Slug Test - An Update". Ground Water vol. 27, no. 3, May-June 1989.

Bouwer, H. and R.C. Rice. 1976. A Slug Test for Determining Hydraulic Conductivity of Unconfined Aquifers With Completely or Partially Penetrating Wells". Water Resources Research. vol 12, no. 3, June 1976.

SE1000C
Environmental Logger
06/27 11:28

Unit# 01579 Test 10

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	00152
Reference	0.000
Linearity	0.030
Scale factor	9.970
Offset	0.020
Delay mSEC	50.000

Step 0 06/27 10:23:15

Elapsed Time	INPUT 1
0.0000	-0.769
0.0033	-0.782
0.0066	-0.775
0.0100	-0.775
0.0133	-0.782
0.0166	-1.107
0.0200	-2.700
0.0233	-3.577
0.0266	-4.069
0.0300	-4.410
0.0333	-4.527
0.0366	-4.366
0.0400	-3.896
0.0433	-3.482
0.0466	-3.198
0.0500	-3.119
0.0533	-3.179
0.0566	-3.201
0.0600	-3.167
0.0633	-3.040
0.0666	-2.504
0.0700	-2.416
0.0733	-2.315
0.0766	-2.368
0.0800	-2.406

0.0833	-2.416
0.0866	-2.384
0.0900	-2.346
0.0933	-2.305
0.0966	-2.274
0.1000	-2.236
0.1033	-2.201
0.1066	-2.176
0.1100	-2.141
0.1133	-2.113
0.1166	-2.088
0.1200	-2.056
0.1233	-2.028
0.1266	-2.002
0.1300	-1.964
0.1333	-1.845
0.1366	-1.775
0.1400	-1.756
0.1433	-1.810
0.1466	-1.829
0.1500	-1.826
0.1533	-1.807
0.1566	-1.791
0.1600	-1.769
0.1633	-1.747
0.1666	-1.725
0.1700	-1.706
0.1733	-1.687
0.1766	-1.668
0.1800	-1.649
0.1833	-1.630
0.1866	-1.611
0.1900	-1.599
0.1933	-1.577
0.1966	-1.561
0.2000	-1.545
0.2033	-1.532
0.2066	-1.510
0.2100	-1.498
0.2133	-1.482
0.2166	-1.466
0.2200	-1.457
0.2233	-1.441
0.2266	-1.428
0.2300	-1.412
0.2333	-1.406
0.2366	-1.390
0.2400	-1.378

0.2433	-1.365
0.2466	-1.353
0.2500	-1.340
0.2533	-1.331
0.2566	-1.321
0.2600	-1.308
0.2633	-1.299
0.2666	-1.283
0.2700	-1.277
0.2733	-1.267
0.2766	-1.258
0.2800	-1.248
0.2833	-1.239
0.2866	-1.230
0.2900	-1.217
0.2933	-1.214
0.2966	-1.204
0.3000	-1.195
0.3033	-1.185
0.3066	-1.179
0.3100	-1.170
0.3133	-1.163
0.3166	-1.154
0.3200	-1.147
0.3233	-1.138
0.3266	-1.135
0.3300	-1.125
0.3333	-1.119
0.3500	-1.084
0.3666	-1.053
0.3833	-1.025
0.4000	-0.999
0.4166	-0.974
0.4333	-0.955
0.4500	-0.936
0.4666	-0.920
0.4833	-0.908
0.5000	-0.895
0.5166	-0.883
0.5333	-0.873
0.5500	-0.864
0.5666	-0.851
0.5833	-0.845
0.6000	-0.838
0.6166	-0.832
0.6333	-0.829
0.6500	-0.826
0.6666	-0.820

0.6833	-0.813
0.7000	-0.810
0.7166	-0.807
0.7333	-0.807
0.7500	-0.804
0.7666	-0.801
0.7833	-0.798
0.8000	-0.794
0.8166	-0.794
0.8333	-0.791
0.8500	-0.788
0.8666	-0.788
0.8833	-0.788
0.9000	-0.785

Client: **AFCEE**

Project: **Eaker AFB Site 074**

Project No.: **734786**

Well No.: **074-MW13**

Test Date: **June 27, 1999**

Formation Tested: **Confined Sand Aquifer**

Rising (R) or Falling (F) Head Test: **Falling Head**

Logger Data File: **mw13-3**

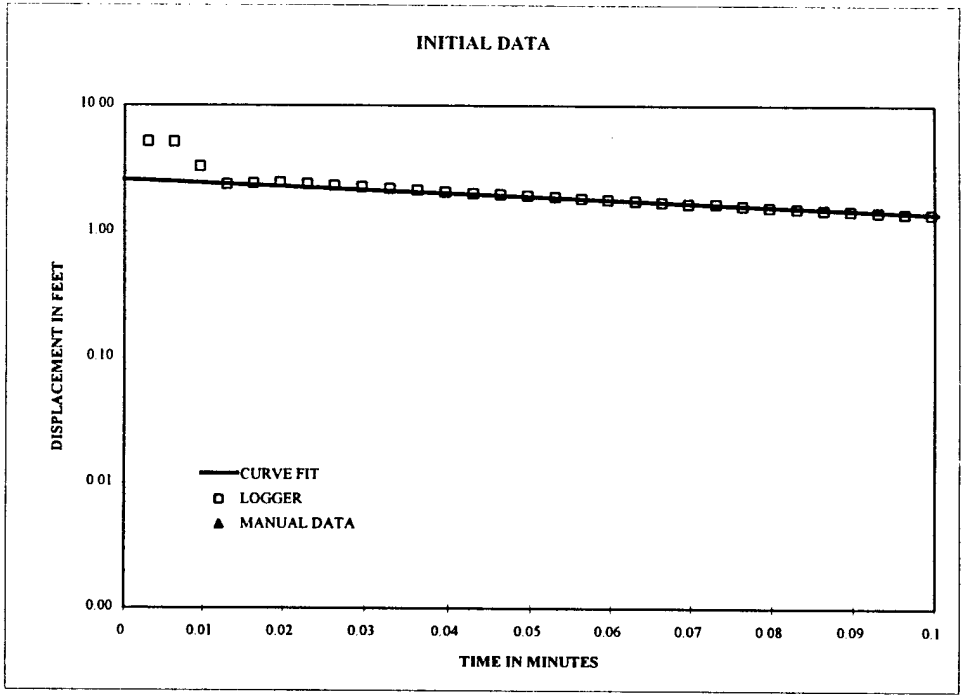
Hydraulic conductivity

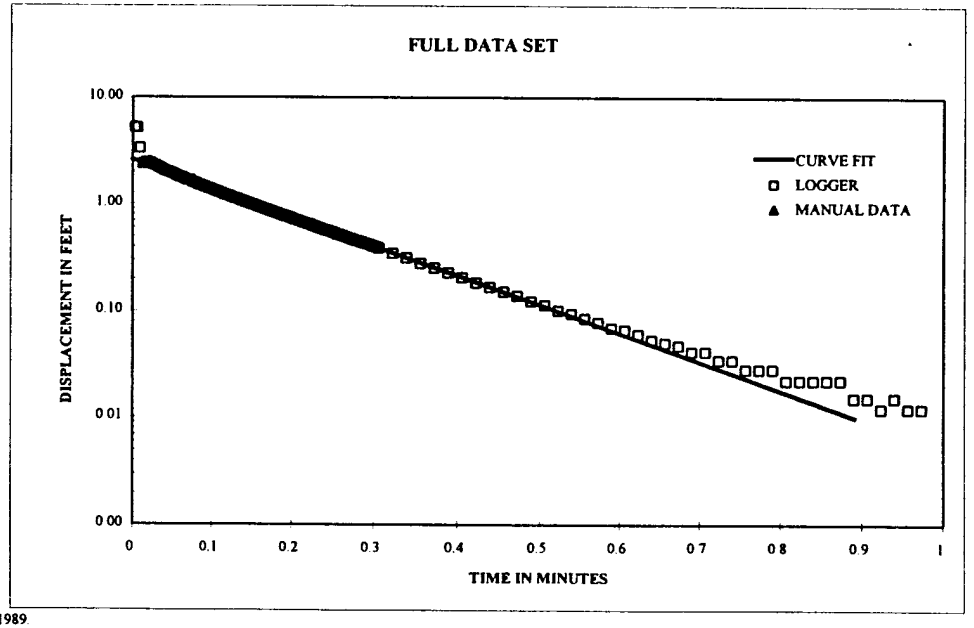
7.60E-03	cm/sec
1.50E-02	ft/min
21.55	ft/day

Casing stickup	0.00	feet
Static water level (from top of casing)	10.28	feet
Depth to bottom of screen (from ground level)	32.30	feet
Boring diameter	8.00	inches
Casing diameter	2.00	inches
Screen diameter	2.00	inches
Screen length	5.00	feet
Depth to "impermeable boundary"	40.00	feet
Porosity of filter pack		
Slug diameter (optional)	1.65	inches
Slug length (optional)	5.20	feet
Theoretical ΔH at time zero (Y_0)	3.54	feet
Actual ΔH at time zero (Y_0)	2.600	feet
ΔH at time t (Y_t)	0.010	feet
Time	0.89	min

Bouwer-Rice Parameters

feet	cm		cm	
10.28	313.33	*SW*		
22.02	671.17	*H*	60.00	*L/Rw*
27.3	832.10	*Ts*	0.74	*H/D*
0.083	2.54	*Rw*	3.30	*A*
0.083	2.54	*Rc*	0.50	*B*
0.167	5.08	*DS*	2.90	*C*
5.00	152.40	*L*	4.53	*Ln[(D-H)/Rw]'*
29.72	905.87	*D*	4.53	*Ln[(D-H)/Rw]*
2.59999997	79.25	Y_e	3.45	equation (8)
0.01	0.30	Y_t	4.07	equation (9)
	53.40	*t (seconds)*	3.45	*Ln(Re/Rw)*
	0.00	*n*	7.6E-03	equation (5)





Bouwer, Herman. 1989. "The Bouwer and Rice Slug Test - An Update". Ground Water vol. 27, no. 3, May-June 1989

Bouwer, H. and R.C. Rice 1976. A Slug Test for Determining Hydraulic Conductivity of Unconfined Aquifers Wit[redacted]letely or Partially Penetrating Wells". Water Resources Research. vol 12, no. 3, June 1976.

SE1000C
Environmental Logger
06/27 11:30

Unit# 01579 Test 11

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	00152
Reference	0.000
Linearity	0.030
Scale factor	9.970
Offset	0.020
Delay mSEC	50.000

Step 0 06/27 10:24:29

Elapsed Time	INPUT 1
0.0000	-0.775
0.0033	-0.775
0.0066	-0.778
0.0100	-0.772
0.0133	-0.775
0.0166	-0.435
0.0200	1.056
0.0233	3.287
0.0266	5.032
0.0300	4.418
0.0333	4.389
0.0366	2.534
0.0400	1.598
0.0433	1.636
0.0466	1.683
0.0500	1.620
0.0533	1.551
0.0566	1.491
0.0600	1.425
0.0633	1.365
0.0666	1.292
0.0700	1.239
0.0733	1.207
0.0766	1.163
0.0800	1.112

0.0833	1.056
0.0866	1.015
0.0900	0.980
0.0933	0.936
0.0966	0.889
0.1000	0.889
0.1033	0.826
0.1066	0.785
0.1100	0.750
0.1133	0.715
0.1166	0.687
0.1200	0.655
0.1233	0.621
0.1266	0.602
0.1300	0.561
0.1333	0.536
0.1366	0.504
0.1400	0.479
0.1433	0.450
0.1466	0.425
0.1500	0.403
0.1533	0.375
0.1566	0.353
0.1600	0.331
0.1633	0.305
0.1666	0.283
0.1700	0.261
0.1733	0.239
0.1766	0.220
0.1800	0.198
0.1833	0.179
0.1866	0.160
0.1900	0.138
0.1933	0.119
0.1966	0.100
0.2000	0.085
0.2033	0.066
0.2066	0.050
0.2100	0.031
0.2133	0.015
0.2166	0.000
0.2200	-0.015
0.2233	-0.028
0.2266	-0.044
0.2300	-0.060
0.2333	-0.072
0.2366	-0.088
0.2400	-0.100

0.2433	-0.116
0.2466	-0.129
0.2500	-0.138
0.2533	-0.154
0.2566	-0.167
0.2600	-0.179
0.2633	-0.192
0.2666	-0.201
0.2700	-0.214
0.2733	-0.224
0.2766	-0.233
0.2800	-0.246
0.2833	-0.258
0.2866	-0.265
0.2900	-0.277
0.2933	-0.287
0.2966	-0.296
0.3000	-0.305
0.3033	-0.315
0.3066	-0.324
0.3100	-0.331
0.3133	-0.340
0.3166	-0.350
0.3200	-0.356
0.3233	-0.365
0.3266	-0.375
0.3300	-0.381
0.3333	-0.391
0.3500	-0.432
0.3666	-0.463
0.3833	-0.498
0.4000	-0.523
0.4166	-0.548
0.4333	-0.570
0.4500	-0.592
0.4666	-0.608
0.4833	-0.624
0.5000	-0.637
0.5166	-0.652
0.5333	-0.662
0.5500	-0.674
0.5666	-0.681
0.5833	-0.690
0.6000	-0.697
0.6166	-0.706
0.6333	-0.709
0.6500	-0.715
0.6666	-0.722

0.6833	-0.725
0.7000	-0.728
0.7166	-0.734
0.7333	-0.734
0.7500	-0.741
0.7666	-0.741
0.7833	-0.747
0.8000	-0.747
0.8166	-0.747
0.8333	-0.753
0.8500	-0.753
0.8666	-0.753
0.8833	-0.753
0.9000	-0.753
0.9166	-0.760
0.9333	-0.760
0.9500	-0.763
0.9666	-0.760
0.9833	-0.763
1.0000	-0.763

Client: **AFCEE**

Project: **Eaker AFB Site 074**

Project No.: **734786**

Well No.: **074-MW13**

Test Date: **June 27, 1999**

Formation Tested: **Confined Sand Aquifer**

Rising (R) or Falling (F) Head Test: **Rising Head**

Logger Data File: **mw13-4**

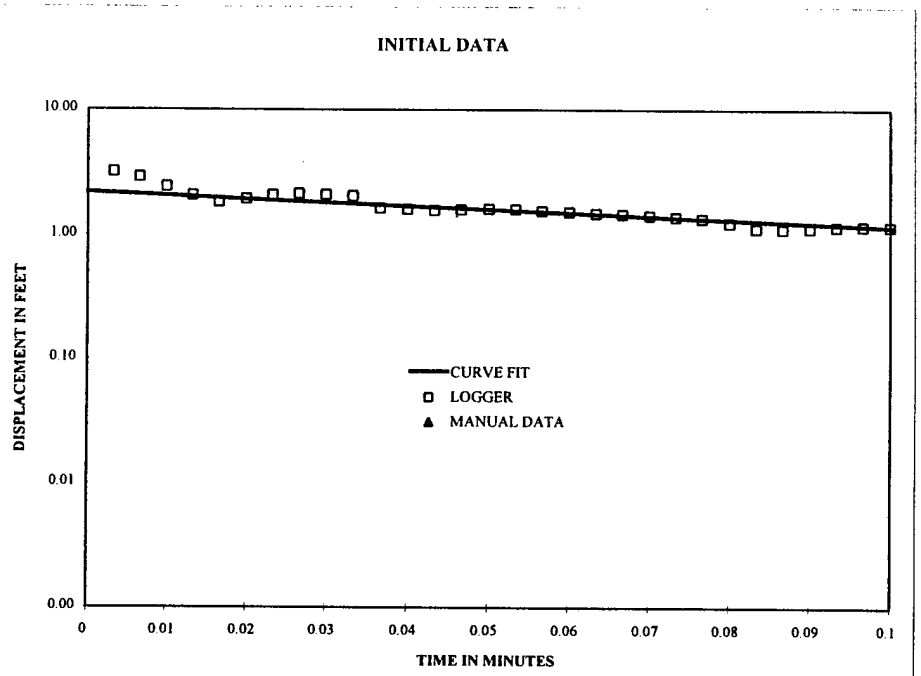
Hydraulic conductivity

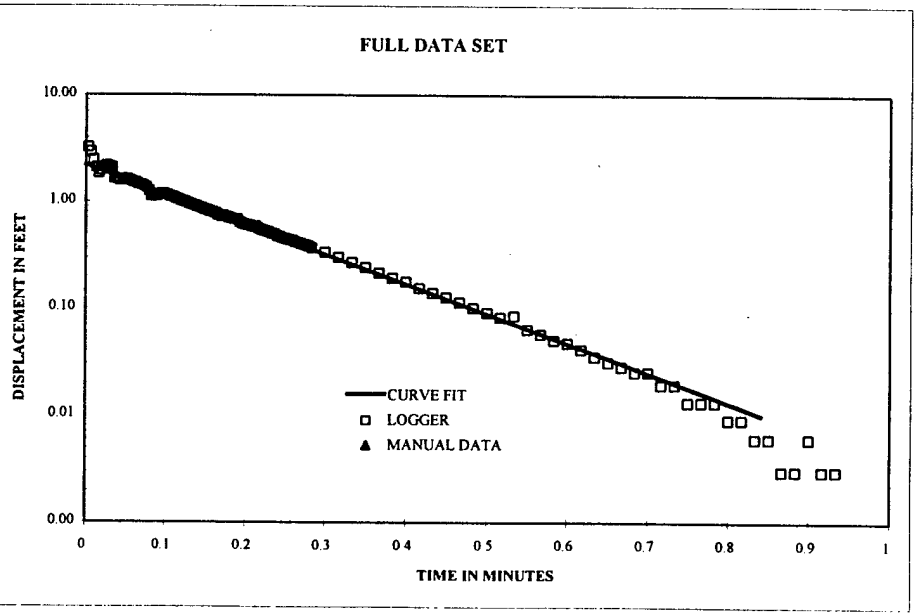
7.81E-03	cm/sec
1.54E-02	ft/min
22.14	ft/day

Casing stickup	0.00	feet
Static water level (from top of casing)	10.28	feet
Depth to bottom of screen (from ground level)	32.30	feet
Boring diameter	8.00	inches
Casing diameter	2.00	inches
Screen diameter	2.00	inches
Screen length	5.00	feet
Depth to "impermeable boundary"	40.00	feet
Porosity of filter pack		
Slug diameter (optional)	1.65	inches
Slug length (optional)	5.20	feet
Theoretical ΔH at time zero (Y_0)	3.54	feet
Actual ΔH at time zero (Y_0)	2.200	feet
ΔH at time t (Y_t)	0.010	feet
Time	0.84	min

Bouwer-Rice Parameters

feet	cm		cm	
10.28	313.33	*SW*		
22.02	671.17	*H*	60.00	*L/Rw*
27.3	832.10	*Ts*	0.74	*H/D*
0.083	2.54	*Rw*	3.30	*A*
0.083	2.54	*Rc*	0.50	*B*
0.167	5.08	*DS*	2.90	*C*
5.00	152.40	*L*	4.53	*Ln[(D-H)/Rw]'*
29.72	905.87	*D*	4.53	*Ln[(D-H)/Rw]*
2.19999997	67.06	Y_0	3.45	equation (8)
0.01	0.30	Y_t	4.07	equation (9)
	50.40	*t (seconds)*	3.45	*Ln(Re/Rw)*
	0.00	*n*	7.8E-03	equation (5)





Bouwer, Herman. 1989. "The Bouwer and Rice Slug Test - An Update". Ground Water vol 27, no. 3, May-June 1989.

Bouwer, H and R.C. Rice. 1976. A Slug Test for Determining Hydraulic Conductivity of Unconfined Aquifers With Completely or Partially Penetrating Wells". Water Resources Research. vol 12, no. 3, June 1976.

SE1000C
Environmental Logger
06/27 11:35

Unit# 01579 Test 12

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	00152
Reference	0.000
Linearity	0.030
Scale factor	9.970
Offset	0.020
Delay mSEC	50.000

Step 0 06/27 10:26:12

Elapsed Time	INPUT 1
0.0000	-0.816
0.0033	-0.816
0.0066	-0.820
0.0100	-0.816
0.0133	-0.820
0.0166	-0.826
0.0200	-0.829
0.0233	-0.832
0.0266	-0.823
0.0300	-0.889
0.0333	-1.516
0.0366	-2.353
0.0400	-3.179
0.0433	-3.744
0.0466	-4.170
0.0500	-4.483
0.0533	-3.984
0.0566	-3.697
0.0600	-3.230
0.0633	-2.861
0.0666	-2.624
0.0700	-2.738
0.0733	-2.873
0.0766	-2.933
0.0800	-2.889

0.0833	-2.842
0.0866	-2.428
0.0900	-2.397
0.0933	-2.362
0.0966	-2.378
0.1000	-2.397
0.1033	-2.384
0.1066	-2.346
0.1100	-2.315
0.1133	-2.274
0.1166	-2.242
0.1200	-2.211
0.1233	-2.176
0.1266	-2.135
0.1300	-2.031
0.1333	-1.908
0.1366	-1.898
0.1400	-1.908
0.1433	-1.946
0.1466	-1.958
0.1500	-1.949
0.1533	-1.930
0.1566	-1.901
0.1600	-1.879
0.1633	-1.854
0.1666	-1.832
0.1700	-1.804
0.1733	-1.788
0.1766	-1.766
0.1800	-1.741
0.1833	-1.722
0.1866	-1.700
0.1900	-1.687
0.1933	-1.665
0.1966	-1.646
0.2000	-1.627
0.2033	-1.611
0.2066	-1.589
0.2100	-1.577
0.2133	-1.561
0.2166	-1.532
0.2200	-1.510
0.2233	-1.520
0.2266	-1.507
0.2300	-1.488
0.2333	-1.476
0.2366	-1.466
0.2400	-1.463

0.2433	-1.422
0.2466	-1.406
0.2500	-1.394
0.2533	-1.384
0.2566	-1.375
0.2600	-1.365
0.2633	-1.368
0.2666	-1.346
0.2700	-1.331
0.2733	-1.318
0.2766	-1.308
0.2800	-1.302
0.2833	-1.286
0.2866	-1.280
0.2900	-1.261
0.2933	-1.252
0.2966	-1.242
0.3000	-1.236
0.3033	-1.226
0.3066	-1.220
0.3100	-1.214
0.3133	-1.201
0.3166	-1.195
0.3200	-1.189
0.3233	-1.179
0.3266	-1.173
0.3300	-1.167
0.3333	-1.154
0.3500	-1.119
0.3666	-1.084
0.3833	-1.053
0.4000	-1.025
0.4166	-0.999
0.4333	-0.977
0.4500	-0.962
0.4666	-0.939
0.4833	-0.924
0.5000	-0.911
0.5166	-0.898
0.5333	-0.886
0.5500	-0.876
0.5666	-0.867
0.5833	-0.870
0.6000	-0.848
0.6166	-0.842
0.6333	-0.835
0.6500	-0.832
0.6666	-0.826

0.6833	-0.820
0.7000	-0.816
0.7166	-0.813
0.7333	-0.810
0.7500	-0.810
0.7666	-0.804
0.7833	-0.804
0.8000	-0.798
0.8166	-0.798
0.8333	-0.798
0.8500	-0.794
0.8666	-0.794
0.8833	-0.791
0.9000	-0.791
0.9166	-0.788
0.9333	-0.788
0.9500	-0.791
0.9666	-0.788
0.9833	-0.788
1.0000	-0.785

Client: **AFCEE**

Project: **Eaker AFB Site 074**

Project No.: **734786**

Well No.: **074-MW13**

Test Date: **June 27, 1999**

Formation Tested: **Confined Sand Aquifer**

Rising (R) or Falling (F) Head Test: **Falling Head**

Logger Data File: **mw13-5**

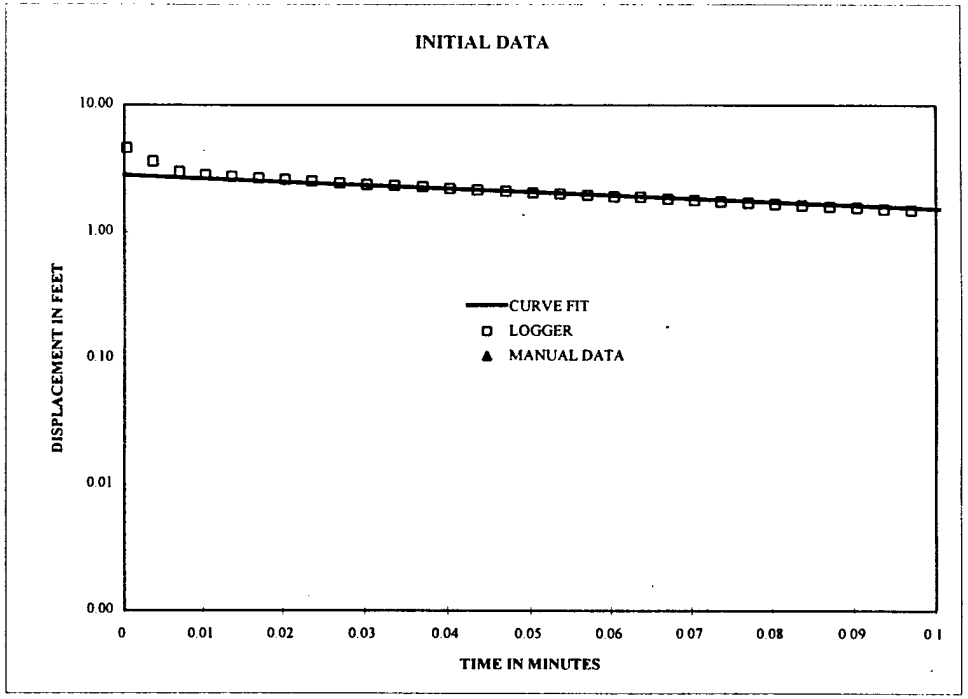
Hydraulic conductivity

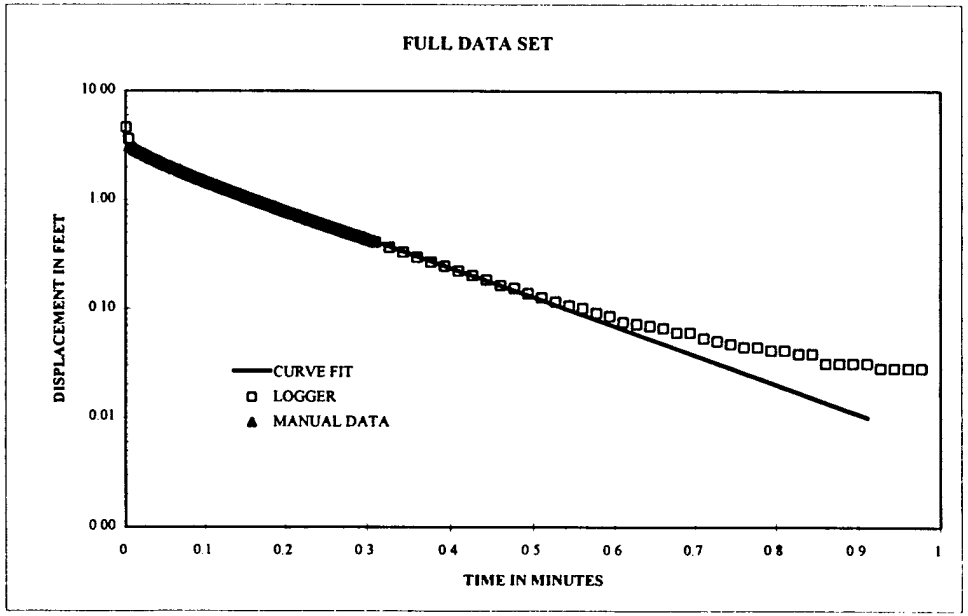
7.55E-03	cm/sec
1.49E-02	ft/min
21.39	ft/day

Casing stickup	0.00	feet
Static water level (from top of casing)	10.28	feet
Depth to bottom of screen (from ground level)	32.30	feet
Boring diameter	8.00	inches
Casing diameter	2.00	inches
Screen diameter	2.00	inches
Screen length	5.00	feet
Depth to "impermeable boundary"	40.00	feet
Porosity of filter pack		
Slug diameter (optional)	1.65	inches
Slug length (optional)	5.20	feet
Theoretical ΔH at time zero (Y_0)	3.54	feet
Actual ΔH at time zero (Y_0)	2.827	feet
ΔH at time t (Y_t)	0.010	feet
Time	0.91	min

Bouwer-Rice Parameters

feet	cm		cm	
10.28	313.33	*SW*		
22.02	671.17	*H*	60.00	*L/Rw*
27.3	832.10	*Ts*	0.74	*H/D*
0.083	2.54	*Rw*	3.30	*A*
0.083	2.54	*Rc*	0.50	*B*
0.167	5.08	*DS*	2.90	*C*
5.00	152.40	*L*	4.53	*Ln[(D-H)/Rw]'*
29.72	905.87	*D*	4.53	*Ln[(D-H)/Rw]*
2.82699997	86.17	Y_e	3.45	equation (8)
0.01	0.30	Y_t	4.07	equation (9)
	54.60	*t (seconds)*	3.45	*Ln(Re/Rw)*
	0.00	*n*	7.5E-03	equation (5)





Bouwer, Herman. 1989. "The Bouwer and Rice Slug Test - An Update". Ground Water vol. 27, no. 3, May-June 1989

Bouwer, H. and R.C. Rice. 1976. A Slug Test for Determining Hydraulic Conductivity of Unconfined Aquifers With Completely or Partially Penetrating Wells". Water Resources Research. vol 12, no. 3, June 1976.

SE1000C
Environmental Logger
06/27 11:37

Unit# 01579 Test 13

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	00152
Reference	0.000
Linearity	0.030
Scale factor	9.970
Offset	0.020
Delay mSEC	50.000

Step 0 06/27 10:27:51

Elapsed Time	INPUT 1
0.0000	-0.791
0.0033	-0.785
0.0066	-0.785
0.0100	-0.791
0.0133	-0.624
0.0166	0.788
0.0200	2.802
0.0233	3.816
0.0266	2.830
0.0300	2.203
0.0333	2.036
0.0366	1.963
0.0400	1.875
0.0433	1.819
0.0466	1.737
0.0500	1.658
0.0533	1.582
0.0566	1.541
0.0600	1.481
0.0633	1.418
0.0666	1.358
0.0700	1.302
0.0733	1.251
0.0766	1.207
0.0800	1.160

0.0833	1.112
0.0866	1.094
0.0900	1.027
0.0933	0.983
0.0966	0.945
0.1000	0.904
0.1033	0.867
0.1066	0.829
0.1100	0.791
0.1133	0.759
0.1166	0.722
0.1200	0.693
0.1233	0.658
0.1266	0.630
0.1300	0.599
0.1333	0.567
0.1366	0.539
0.1400	0.510
0.1433	0.482
0.1466	0.457
0.1500	0.428
0.1533	0.403
0.1566	0.378
0.1600	0.356
0.1633	0.331
0.1666	0.309
0.1700	0.286
0.1733	0.261
0.1766	0.239
0.1800	0.220
0.1833	0.198
0.1866	0.179
0.1900	0.160
0.1933	0.138
0.1966	0.119
0.2000	0.100
0.2033	0.085
0.2066	0.069
0.2100	0.050
0.2133	0.031
0.2166	0.015
0.2200	0.000
0.2233	-0.015
0.2266	-0.031
0.2300	-0.047
0.2333	-0.063
0.2366	-0.075
0.2400	-0.091

0.2433	-0.104
0.2466	-0.116
0.2500	-0.132
0.2533	-0.145
0.2566	-0.157
0.2600	-0.167
0.2633	-0.182
0.2666	-0.192
0.2700	-0.205
0.2733	-0.217
0.2766	-0.230
0.2800	-0.239
0.2833	-0.249
0.2866	-0.258
0.2900	-0.271
0.2933	-0.280
0.2966	-0.290
0.3000	-0.299
0.3033	-0.309
0.3066	-0.318
0.3100	-0.328
0.3133	-0.337
0.3166	-0.343
0.3200	-0.353
0.3233	-0.362
0.3266	-0.372
0.3300	-0.381
0.3333	-0.387
0.3500	-0.429
0.3666	-0.463
0.3833	-0.498
0.4000	-0.526
0.4166	-0.548
0.4333	-0.573
0.4500	-0.592
0.4666	-0.611
0.4833	-0.630
0.5000	-0.640
0.5166	-0.656
0.5333	-0.668
0.5500	-0.678
0.5666	-0.687
0.5833	-0.693
0.6000	-0.703
0.6166	-0.709
0.6333	-0.719
0.6500	-0.722
0.6666	-0.725

0.6833	-0.728
0.7000	-0.734
0.7166	-0.734
0.7333	-0.741
0.7500	-0.744
0.7666	-0.747
0.7833	-0.750
0.8000	-0.750
0.8166	-0.753
0.8333	-0.753
0.8500	-0.756
0.8666	-0.756
0.8833	-0.763
0.9000	-0.763
0.9166	-0.763
0.9333	-0.763
0.9500	-0.766
0.9666	-0.766
0.9833	-0.766
1.0000	-0.766

Client: **AFCEE**

Project: **Eaker AFB Site 074**

Project No.: **734786**

Well No.: **074-MW15I**

Test Date: **June 27, 1999**

Formation Tested: **Confined Sand Aquifer**

Rising (R) or Falling (F) Head Test: **Rising Head**

Logger Data File: **mw15i-3**

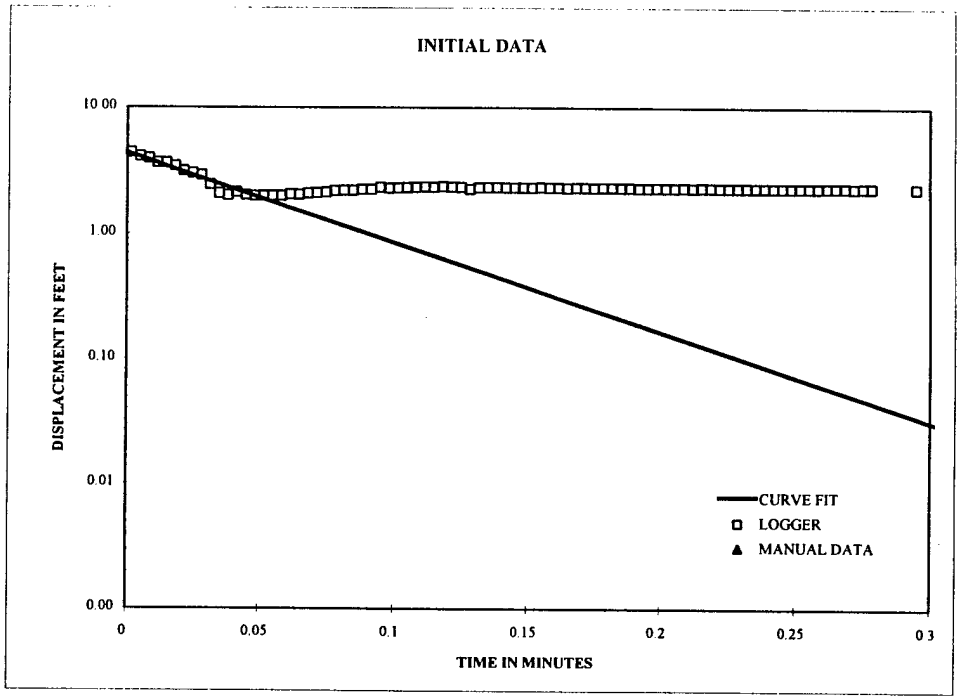
Hydraulic conductivity

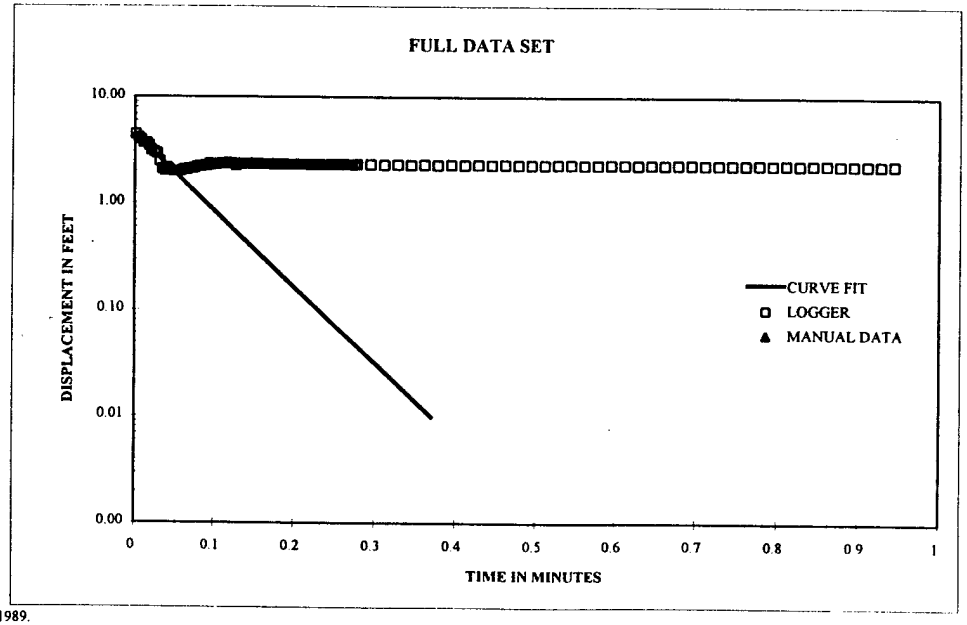
2.08E-02	cm/sec
4.09E-02	ft/min
58.89	ft/day

Casing stickup	0.00	feet
Static water level (from top of casing)	11.51	feet
Depth to bottom of screen (from ground level)	44.42	feet
Boring diameter	8.00	inches
Casing diameter	2.00	inches
Screen diameter	2.00	inches
Screen length	5.00	feet
Depth to "impermeable boundary"	55.00	feet
Porosity of filter pack		
Slug diameter (optional)	1.65	inches
Slug length (optional)	5.20	feet
Theoretical ΔH at time zero (Y_0)	3.54	feet
Actual ΔH at time zero (Y_0)	4.400	feet
ΔH at time t (Y_t)	0.010	feet
Time	0.37	min

Bouwer-Rice Parameters

feet	cm		cm	
11.51	350.82	*SW*		
32.91	1003.10	*H*	60.00	*L/Rw*
39.42	1201.52	*Ts*	0.76	*H/D*
0.083	2.54	*Rw*	3.30	*A*
0.083	2.54	*Rc*	0.50	*B*
0.167	5.08	*DS*	2.90	*C*
5.00	152.40	*L*	4.84	*Ln[(D-H)/Rw]'*
43.49	1325.58	*D*	4.84	*Ln[(D-H)/Rw]*
4.4	134.11	Y_0	3.58	equation (8)
0.01	0.30	Y_t	4.30	equation (9)
	22.20	*t (seconds)*	3.58	*Ln(Re/Rw)*
	0.00	*n*	2.1E-02	equation (5)





Bouwer, Herman. 1989. "The Bouwer and Rice Slug Test - An Update". Ground Water vol. 27, no. 3, May-June 1989.

Bouwer, H. and R.C. Rice. 1976. A Slug Test for Determining Hydraulic Conductivity of Unconfined Aquifers With Completely or Partially Penetrating Wells". Water Resources Research vol 12, no 3, June 1976.

SE1000C
Environmental Logger
06/27 11:22

Unit# 01579 Test 7

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	00152
Reference	0.000
Linearity	0.030
Scale factor	9.970
Offset	0.020
Delay mSEC	50.000

Step 0 06/27 10:03:32

Elapsed Time	INPUT 1
0.0000	0.006
0.0033	0.031
0.0066	0.003
0.0100	0.025
0.0133	0.006
0.0166	0.025
0.0200	-0.012
0.0233	-0.015
0.0266	-0.009
0.0300	-0.022
0.0333	-0.037
0.0366	-2.277
0.0400	-1.507
0.0433	-1.655
0.0466	-1.759
0.0500	-1.939
0.0533	-1.927
0.0566	-2.116
0.0600	-1.819
0.0633	-1.662
0.0666	-1.371
0.0700	-1.365
0.0733	-1.141
0.0766	-0.851
0.0800	-0.728

0.0833	-0.621
0.0866	-0.170
0.0900	0.201
0.0933	0.271
0.0966	0.148
0.1000	0.261
0.1033	0.302
0.1066	0.293
0.1100	0.293
0.1133	0.302
0.1166	0.242
0.1200	0.245
0.1233	0.204
0.1266	0.189
0.1300	0.163
0.1333	0.107
0.1366	0.088
0.1400	0.085
0.1433	0.056
0.1466	0.053
0.1500	-0.050
0.1533	-0.003
0.1566	-0.015
0.1600	-0.031
0.1633	-0.050
0.1666	-0.053
0.1700	-0.047
0.1733	-0.075
0.1766	-0.060
0.1800	-0.050
0.1833	0.031
0.1866	-0.025
0.1900	-0.047
0.1933	-0.047
0.1966	-0.034
0.2000	-0.037
0.2033	-0.037
0.2066	-0.031
0.2100	-0.041
0.2133	-0.031
0.2166	-0.031
0.2200	-0.022
0.2233	-0.028
0.2266	-0.031
0.2300	-0.015
0.2333	-0.025
0.2366	-0.025
0.2400	-0.022

0.2433	-0.015
0.2466	-0.009
0.2500	-0.006
0.2533	-0.012
0.2566	-0.009
0.2600	-0.006
0.2633	-0.012
0.2666	-0.009
0.2700	-0.012
0.2733	-0.012
0.2766	-0.003
0.2800	-0.009
0.2833	-0.006
0.2866	-0.009
0.2900	-0.003
0.2933	0.000
0.2966	-0.003
0.3000	-0.003
0.3033	-0.009
0.3066	-0.006
0.3100	-0.009
0.3133	-0.003
0.3166	-0.015
0.3200	-0.012
0.3233	-0.012
0.3266	0.000
0.3300	-0.012
0.3333	-0.012
0.3500	-0.006
0.3666	-0.003
0.3833	-0.009
0.4000	0.000
0.4166	-0.006
0.4333	-0.003
0.4500	-0.006
0.4666	-0.003
0.4833	-0.012
0.5000	-0.003
0.5166	-0.012
0.5333	-0.003
0.5500	-0.003
0.5666	0.000
0.5833	-0.006
0.6000	-0.006
0.6166	-0.003
0.6333	0.000
0.6500	-0.006
0.6666	-0.009

0.6833	-0.003
0.7000	-0.006
0.7166	0.000
0.7333	-0.006
0.7500	-0.006
0.7666	0.000
0.7833	0.000
0.8000	0.000
0.8166	0.000
0.8333	-0.012
0.8500	-0.003
0.8666	-0.009
0.8833	0.000
0.9000	-0.012
0.9166	-0.006
0.9333	0.000
0.9500	-0.003
0.9666	0.006
0.9833	0.000
1.0000	-0.006

Client: **AFCEE**

Project: **Eaker AFB Site 074**

Project No.: **734786**

Well No.: **074-MW15D**

Test Date: **June 27, 1999**

Formation Tested: **Confined Sand Aquifer**

Rising (R) or Falling (F) Head Test: **Rising Head**

Logger Data File: **mw15d-1**

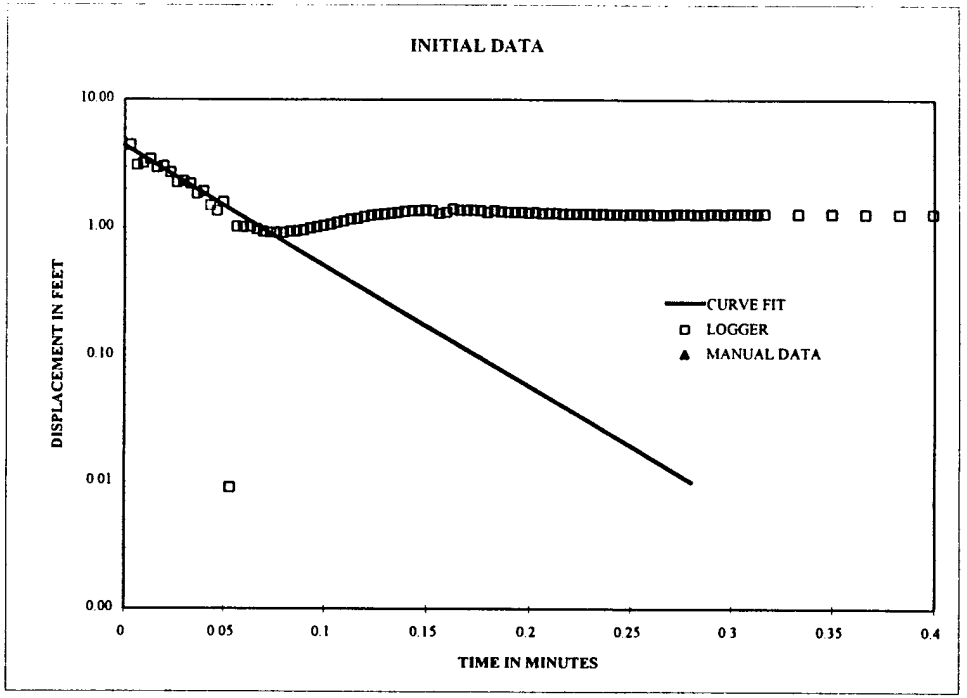
Hydraulic conductivity

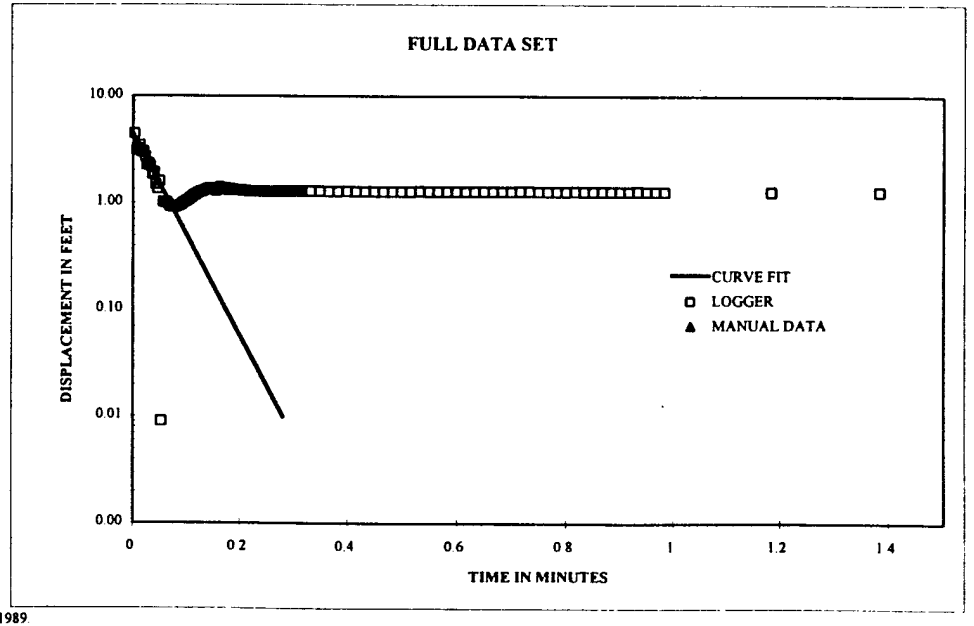
2.89E-02	cm/sec
5.68E-02	ft/min
81.85	ft/day

Casing stickup	0.00	feet
Static water level (from top of casing)	11.77	feet
Depth to bottom of screen (from ground level)	64.69	feet
Boring diameter	8.00	inches
Casing diameter	2.00	inches
Screen diameter	2.00	inches
Screen length	5.00	feet
Depth to "impermeable boundary"	75.00	feet
Porosity of filter pack		
Slug diameter (optional)	1.65	inches
Slug length (optional)	5.20	feet
Theoretical ΔH at time zero (Y_0)	3.54	feet
Actual ΔH at time zero (Y_0)	4.400	feet
ΔH at time t (Y_t)	0.010	feet
Time	0.28	min

Bouwer-Rice Parameters

feet	cm		cm	
11.77	358.75	*SW*		
52.92	1613.00	*H*	60.00	*L/Rw*
59.69	1819.35	*Ts*	0.84	*H/D*
0.083	2.54	*Rw*	3.30	*A*
0.083	2.54	*Rc*	0.50	*B*
0.167	5.08	*DS*	2.90	*C*
5.00	152.40	*L*	4.82	*Ln[(D-H)/Rw]'*
63.23	1927.25	*D*	4.82	*Ln[(D-H)/Rw]*
4.40000004	134.11	Y_0	3.77	equation (8)
0.01	0.30	Y_t	4.57	equation (9)
	16.80	*t (seconds)*	3.77	*Ln(Re/Rw)*
	0.00	*n*	2.9E-02	equation (5)





Bouwer, Herman. 1989. "The Bouwer and Rice Slug Test - An Update". Ground Water vol 27, no. 3, May-June 1989.

Bouwer, H. and R.C. Rice. 1976. A Slug Test for Determining Hydraulic Conductivity of Unconfined Aquifers Wi[illegible]letely or Partially Penetrating Wells". Water Resources Research. vol 12, no. 3, June 1976.

SE1000C
Environmental Logger
06/27 10:55

Unit# 01579 Test 0

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	00152
Reference	0.000
Linearity	0.030
Scale factor	9.970
Offset	0.020
Delay mSEC	50.000

Step 0 06/27 09:43:29

Elapsed Time	INPUT 1
0.0000	-0.006
0.0033	-0.015
0.0066	-0.018
0.0100	-0.025
0.0133	-0.034
0.0166	-5.916
0.0200	-3.170
0.0233	-1.832
0.0266	-1.933
0.0300	-2.169
0.0333	-1.693
0.0366	-1.753
0.0400	-1.434
0.0433	-0.993
0.0466	-1.050
0.0500	-0.939
0.0533	-0.580
0.0566	-0.649
0.0600	-0.217
0.0633	-0.085
0.0666	-0.318
0.0700	1.261
0.0733	0.255
0.0766	0.261
0.0800	0.255

0.0833	0.299
0.0866	0.340
0.0900	0.356
0.0933	0.353
0.0966	0.362
0.1000	0.340
0.1033	0.334
0.1066	0.318
0.1100	0.283
0.1133	0.258
0.1166	0.236
0.1200	0.214
0.1233	0.173
0.1266	0.151
0.1300	0.110
0.1333	0.094
0.1366	0.053
0.1400	0.028
0.1433	0.006
0.1466	-0.006
0.1500	-0.025
0.1533	-0.044
0.1566	-0.063
0.1600	-0.082
0.1633	-0.085
0.1666	-0.097
0.1700	-0.085
0.1733	-0.018
0.1766	-0.053
0.1800	-0.126
0.1833	-0.097
0.1866	-0.097
0.1900	-0.100
0.1933	-0.088
0.1966	-0.041
0.2000	-0.085
0.2033	-0.059
0.2066	-0.053
0.2100	-0.047
0.2133	-0.050
0.2166	-0.037
0.2200	-0.041
0.2233	-0.022
0.2266	-0.028
0.2300	-0.025
0.2333	-0.015
0.2366	-0.015
0.2400	-0.009

0.2433	-0.015
0.2466	-0.009
0.2500	-0.003
0.2533	-0.009
0.2566	-0.003
0.2600	-0.003
0.2633	0.000
0.2666	-0.006
0.2700	-0.006
0.2733	0.003
0.2766	-0.006
0.2800	0.000
0.2833	0.003
0.2866	0.003
0.2900	-0.009
0.2933	-0.006
0.2966	-0.003
0.3000	0.003
0.3033	0.006
0.3066	-0.012
0.3100	-0.015
0.3133	-0.006
0.3166	-0.012
0.3200	-0.012
0.3233	-0.015
0.3266	-0.015
0.3300	-0.009
0.3333	-0.022
0.3500	-0.009
0.3666	-0.012
0.3833	-0.006
0.4000	-0.003
0.4166	-0.009
0.4333	-0.006
0.4500	-0.003
0.4666	-0.003
0.4833	-0.003
0.5000	-0.006
0.5166	-0.003
0.5333	-0.003
0.5500	-0.012
0.5666	-0.006
0.5833	-0.006
0.6000	-0.003
0.6166	-0.003
0.6333	-0.003
0.6500	-0.003
0.6666	-0.006

0.6833	-0.006
0.7000	-0.006
0.7166	-0.003
0.7333	-0.009
0.7500	-0.012
0.7666	-0.003
0.7833	-0.003
0.8000	0.000
0.8166	-0.003
0.8333	-0.009
0.8500	-0.003
0.8666	-0.006
0.8833	-0.003
0.9000	-0.003
0.9166	-0.003
0.9333	-0.006
0.9500	-0.009
0.9666	-0.003
0.9833	-0.006
1.0000	-0.003
1.2000	-0.006
1.4000	-0.003
1.6000	-0.003
1.8000	-0.009
2.0000	-0.009

Client: **AFCEE**

Project: **Eaker AFB Site 074**

Project No.: **734786**

Well No.: **074-MW15D**

Test Date: **June 27, 1999**

Formation Tested: **Confined Sand Aquifer**

Rising (R) or Falling (F) Head Test: **Falling Head**

Logger Data File: **mw15d-2**

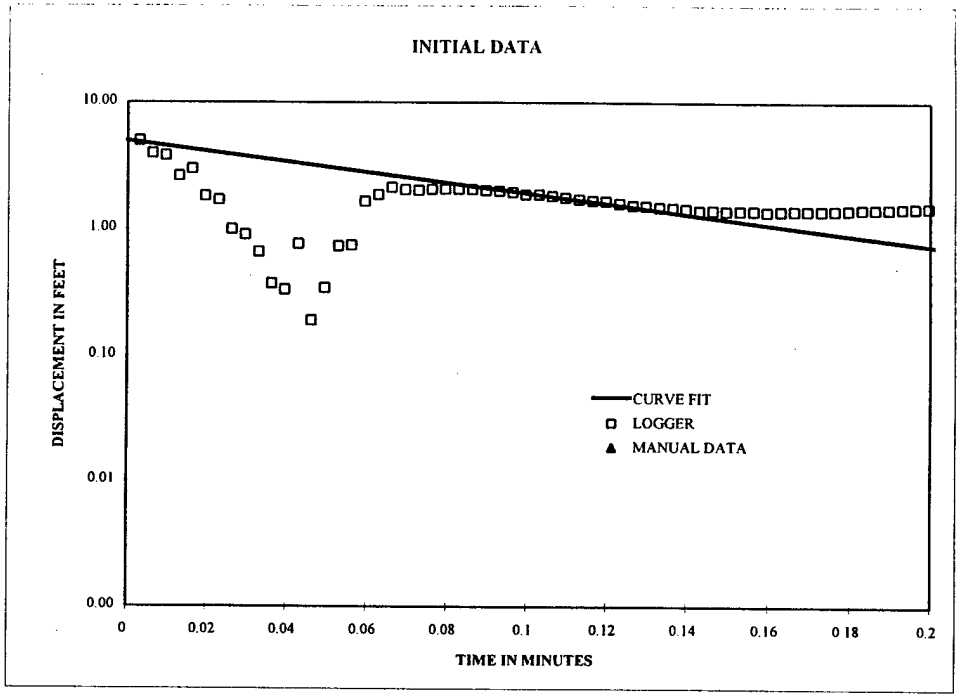
Hydraulic conductivity

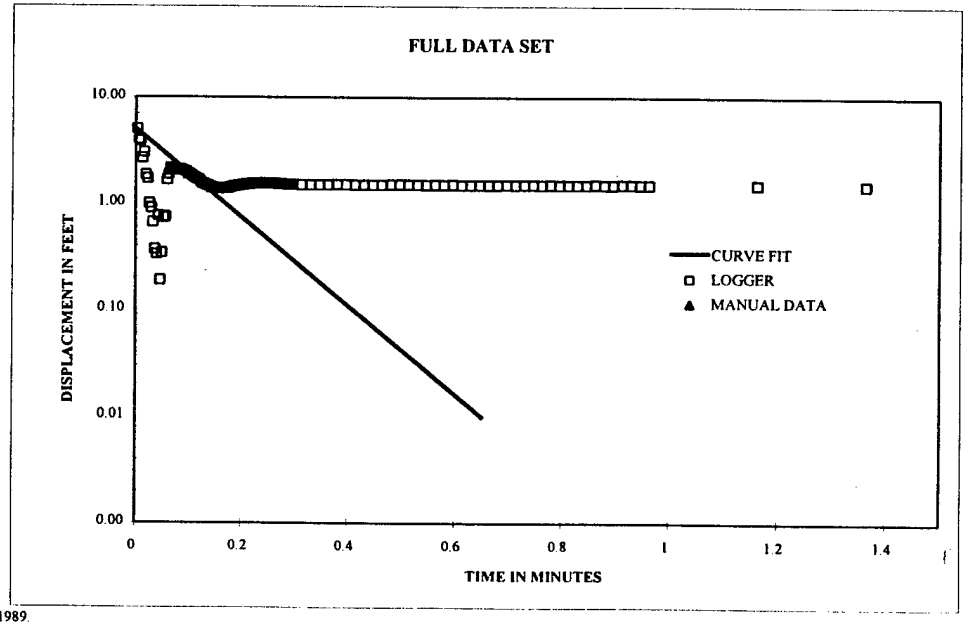
1.27E-02	cm/sec
2.50E-02	ft/min
36.00	ft/day

Casing stickup	0.00	feet
Static water level (from top of casing)	11.77	feet
Depth to bottom of screen (from ground level)	64.69	feet
Boring diameter	8.00	inches
Casing diameter	2.00	inches
Screen diameter	2.00	inches
Screen length	5.00	feet
Depth to "impermeable boundary"	75.00	feet
Porosity of filter pack		
Slug diameter (optional)	1.65	inches
Slug length (optional)	5.20	feet
Theoretical ΔH at time zero (Y_0)	3.54	feet
Actual ΔH at time zero (Y_0)	5.000	feet
ΔH at time t (Y_t)	0.010	feet
Time	0.65	min

Bouwer-Rice Parameters

feet	cm		cm	
11.77	358.75	*SW*		
52.92	1613.00	*H*	60.00	*L/Rw*
59.69	1819.35	*Ts*	0.84	*H/D*
0.083	2.54	*Rw*	3.30	*A*
0.083	2.54	*Rc*	0.50	*B*
0.167	5.08	*DS*	2.90	*C*
5.00	152.40	*L*	4.82	*Ln[(D-H)/Rw]'*
63.23	1927.25	*D*	4.82	*Ln[(D-H)/Rw]*
5	152.40	Y_0	3.77	equation (8)
0.01	0.30	Y_t	4.57	equation (9)
	39.00	*t (seconds)*	3.77	*Ln(Re/Rw)*
	0.00	*n*	1.3E-02	equation (5)





Bouwer, Herman. 1989. "The Bouwer and Rice Slug Test - An Update". Ground Water vol. 27, no. 3, May-June 1989.

Bouwer, H. and R.C. Rice. 1976. A Slug Test for Determining Hydraulic Conductivity of Unconfined Aquifers With Completely or Partially Penetrating Wells". Water Resources Research. vol 12, no. 3, June 1976.

SE1000C
Environmental Logger
06/27 11:00

Unit# 01579 Test 1

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	00152
Reference	0.000
Linearity	0.030
Scale factor	9.970
Offset	0.020
Delay mSEC	50.000

Step 0 06/27 09:46:12

Elapsed Time	INPUT 1
0.0000	-0.009
0.0033	-0.028
0.0066	-0.034
0.0100	-0.006
0.0133	0.019
0.0166	-0.028
0.0200	0.034
0.0233	-0.053
0.0266	-0.015
0.0300	3.060
0.0333	4.550
0.0366	5.731
0.0400	3.488
0.0433	2.465
0.0466	2.320
0.0500	1.131
0.0533	1.488
0.0566	0.318
0.0600	0.192
0.0633	-0.514
0.0666	-0.608
0.0700	-0.851
0.0733	-1.141
0.0766	-1.179
0.0800	-0.747

0.0833	-1.321
0.0866	-1.170
0.0900	-0.778
0.0933	-0.766
0.0966	0.141
0.1000	0.353
0.1033	0.627
0.1066	0.545
0.1100	0.520
0.1133	0.551
0.1166	0.567
0.1200	0.561
0.1233	0.558
0.1266	0.514
0.1300	0.488
0.1333	0.450
0.1366	0.368
0.1400	0.368
0.1433	0.312
0.1466	0.258
0.1500	0.211
0.1533	0.173
0.1566	0.154
0.1600	0.088
0.1633	0.028
0.1666	0.012
0.1700	-0.018
0.1733	-0.041
0.1766	-0.059
0.1800	-0.107
0.1833	-0.100
0.1866	-0.126
0.1900	-0.116
0.1933	-0.116
0.1966	-0.135
0.2000	-0.126
0.2033	-0.113
0.2066	-0.116
0.2100	-0.113
0.2133	-0.104
0.2166	-0.100
0.2200	-0.075
0.2233	-0.069
0.2266	-0.066
0.2300	-0.047
0.2333	-0.041
0.2366	-0.028
0.2400	-0.015

0.2433	-0.009
0.2466	0.000
0.2500	0.006
0.2533	0.015
0.2566	0.015
0.2600	0.025
0.2633	0.028
0.2666	0.028
0.2700	0.028
0.2733	0.034
0.2766	0.034
0.2800	0.034
0.2833	0.034
0.2866	0.028
0.2900	0.025
0.2933	0.028
0.2966	0.025
0.3000	0.022
0.3033	0.022
0.3066	0.012
0.3100	0.012
0.3133	0.006
0.3166	0.003
0.3200	0.006
0.3233	0.006
0.3266	-0.003
0.3300	-0.009
0.3333	-0.009
0.3500	-0.022
0.3666	-0.018
0.3833	-0.018
0.4000	-0.015
0.4166	-0.009
0.4333	-0.012
0.4500	-0.015
0.4666	-0.015
0.4833	-0.015
0.5000	-0.015
0.5166	-0.012
0.5333	-0.009
0.5500	-0.009
0.5666	-0.009
0.5833	-0.015
0.6000	-0.012
0.6166	-0.015
0.6333	-0.009
0.6500	-0.018
0.6666	-0.015

0.6833	-0.015
0.7000	-0.015
0.7166	-0.018
0.7333	-0.009
0.7500	-0.015
0.7666	-0.009
0.7833	-0.009
0.8000	-0.015
0.8166	-0.012
0.8333	-0.015
0.8500	-0.015
0.8666	-0.015
0.8833	-0.015
0.9000	-0.012
0.9166	-0.015
0.9333	-0.015
0.9500	-0.009
0.9666	-0.006
0.9833	-0.015
1.0000	-0.015
1.2000	-0.009
1.4000	-0.015

Client: **AFCEE**

Project: **Eaker AFB Site 074**

Project No.: **734786**

Well No.: **074-MW15D**

Test Date: **June 27, 1999**

Formation Tested: **Confined Sand Aquifer**

Rising (R) or Falling (F) Head Test: **Rising Head**

Logger Data File: **mw15d-3**

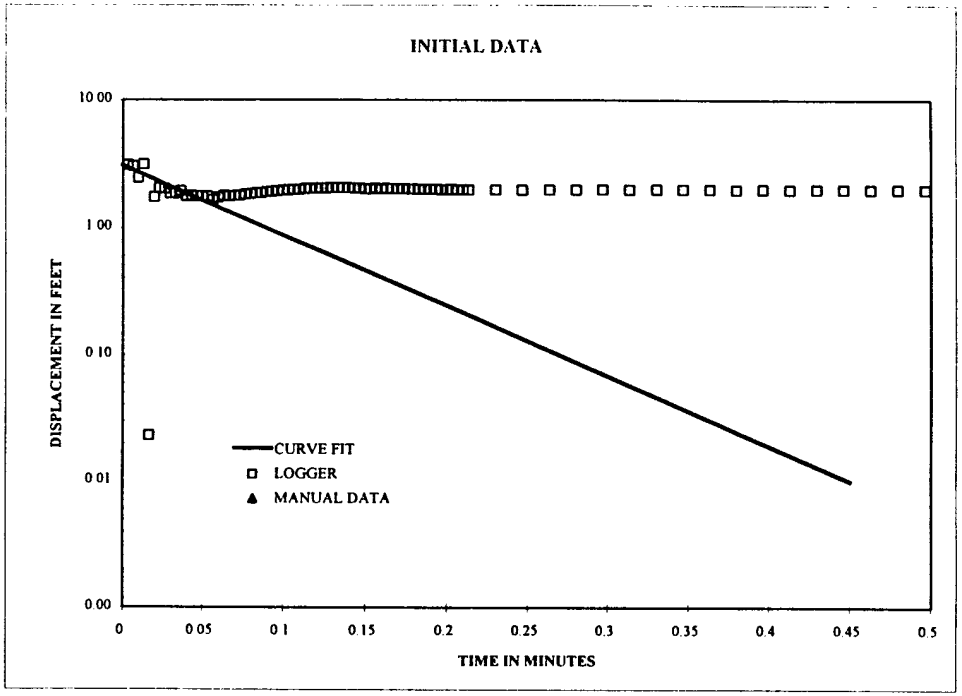
Hydraulic conductivity

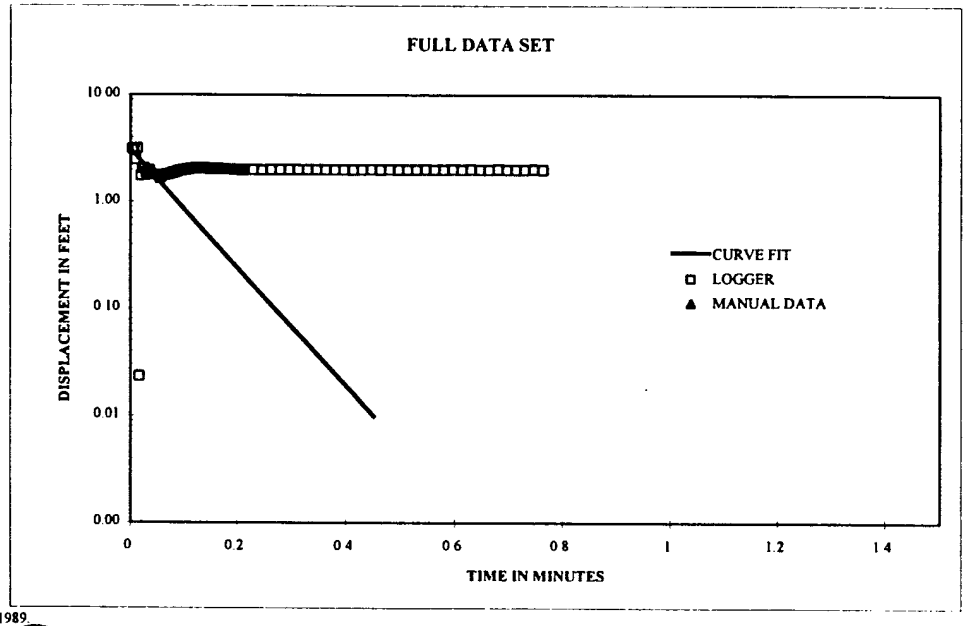
1.69E-02	cm/sec
3.33E-02	ft/min
48.00	ft/day

Casing stickup	0.00	feet
Static water level (from top of casing)	11.77	feet
Depth to bottom of screen (from ground level)	64.69	feet
Boring diameter	8.00	inches
Casing diameter	2.00	inches
Screen diameter	2.00	inches
Screen length	5.00	feet
Depth to "impermeable boundary"	75.00	feet
Porosity of filter pack		
Slug diameter (optional)	1.65	inches
Slug length (optional)	5.20	feet
Theoretical ΔH at time zero (Y_0)	3.54	feet
Actual ΔH at time zero (Y_0)	3.100	feet
ΔH at time t (Y_t)	0.010	feet
Time	0.45	min

Bouwer-Rice Parameters

feet	cm		cm	
11.77	358.75	*SW*		
52.92	1613.00	*H*	60.00	*L/Rw*
59.69	1819.35	*Ts*	0.84	*H/D*
0.083	2.54	*Rw*	3.30	*A*
0.083	2.54	*Rc*	0.50	*B*
0.167	5.08	*DS*	2.90	*C*
5.00	152.40	*L*	4.82	*Ln[(D-H)/Rw]'*
63.23	1927.25	*D*	4.82	*Ln[(D-H)/Rw]*
3.10000002	94.49	Y_0	3.77	equation (8)
0.01	0.30	Y_t	4.57	equation (9)
	27.00	*t (seconds)*	3.77	*Ln(Re/Rw)*
	0.00	*n*	1.7E-02	equation (5)





Bouwer, Herman. 1989. "The Bouwer and Rice Slug Test - An Update". Ground Water vol. 27, no. 3, May-June 1989.

Bouwer, H. and R.C. Rice. 1976. A Slug Test for Determining Hydraulic Conductivity of Unconfined Aquifers W[illegible]etely or Partially Penetrating Wells". Water Resources Research. vol 12, no. 3, June 1976.

SE1000C
Environmental Logger
06/27 11:11

Unit# 01579 Test 2

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	00152
Reference	0.000
Linearity	0.030
Scale factor	9.970
Offset	0.020
Delay mSEC	50.000

Step 0 06/27 09:48:52

Elapsed Time	INPUT 1
0.0000	-0.006
0.0033	0.000
0.0066	-0.022
0.0100	-0.012
0.0133	-0.018
0.0166	-0.009
0.0200	-0.009
0.0233	-0.003
0.0266	-0.015
0.0300	0.000
0.0333	-0.018
0.0366	-0.012
0.0400	-0.009
0.0433	-0.015
0.0466	-0.015
0.0500	-0.031
0.0533	-0.031
0.0566	-0.015
0.0600	-0.025
0.0633	-0.025
0.0666	0.003
0.0700	0.000
0.0733	-0.025
0.0766	0.006
0.0800	-0.037

0.0833	0.006
0.0866	-0.022
0.0900	-2.867
0.0933	-1.602
0.0966	-2.094
0.1000	-2.289
0.1033	-2.220
0.1066	-2.078
0.1100	-1.633
0.1133	-1.712
0.1166	-1.627
0.1200	-1.545
0.1233	-1.135
0.1266	-1.056
0.1300	-0.488
0.1333	-1.163
0.1366	1.957
0.1400	0.233
0.1433	-0.072
0.1466	-0.050
0.1500	0.123
0.1533	0.119
0.1566	0.028
0.1600	0.211
0.1633	0.192
0.1666	0.205
0.1700	0.208
0.1733	0.220
0.1766	0.324
0.1800	0.249
0.1833	0.201
0.1866	0.208
0.1900	0.192
0.1933	0.182
0.1966	0.154
0.2000	0.135
0.2033	0.116
0.2066	0.097
0.2100	0.072
0.2133	0.044
0.2166	0.031
0.2200	0.009
0.2233	0.000
0.2266	-0.015
0.2300	-0.028
0.2333	-0.044
0.2366	-0.056
0.2400	-0.059

0.2433	-0.066
0.2466	-0.075
0.2500	-0.078
0.2533	-0.085
0.2566	-0.085
0.2600	-0.082
0.2633	-0.072
0.2666	-0.069
0.2700	-0.047
0.2733	-0.031
0.2766	-0.066
0.2800	-0.031
0.2833	-0.053
0.2866	-0.050
0.2900	-0.041
0.2933	-0.044
0.2966	-0.041
0.3000	-0.034
0.3033	-0.028
0.3066	-0.022
0.3100	-0.028
0.3133	-0.022
0.3166	-0.015
0.3200	-0.015
0.3233	-0.018
0.3266	-0.006
0.3300	-0.015
0.3333	-0.006
0.3500	-0.009
0.3666	-0.003
0.3833	-0.009
0.4000	-0.015
0.4166	-0.018
0.4333	-0.009
0.4500	-0.018
0.4666	-0.018
0.4833	-0.018
0.5000	-0.015
0.5166	-0.018
0.5333	-0.015
0.5500	-0.018
0.5666	-0.022
0.5833	-0.015
0.6000	-0.022
0.6166	-0.015
0.6333	-0.018
0.6500	-0.018
0.6666	-0.022

0.6833	-0.018
0.7000	-0.015
0.7166	-0.022
0.7333	-0.012
0.7500	-0.022
0.7666	-0.018
0.7833	-0.018
0.8000	-0.022
0.8166	-0.015
0.8333	-0.018
0.8500	-0.012
0.8666	-0.022
0.8833	-0.018

Client: **AFCEE**

Project: **Eaker AFB Site 074**

Project No.: **734786**

Well No.: **074-MW15D**

Test Date: **June 27, 1999**

Formation Tested: **Confined Sand Aquifer**

Rising (R) or Falling (F) Head Test: **Falling Head**

Logger Data File: **mw15d-4**

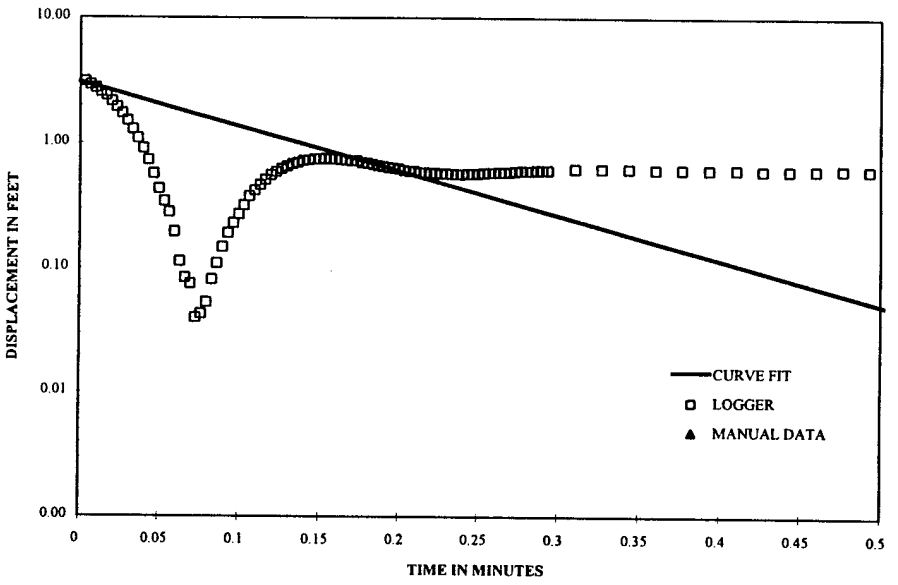
Hydraulic conductivity

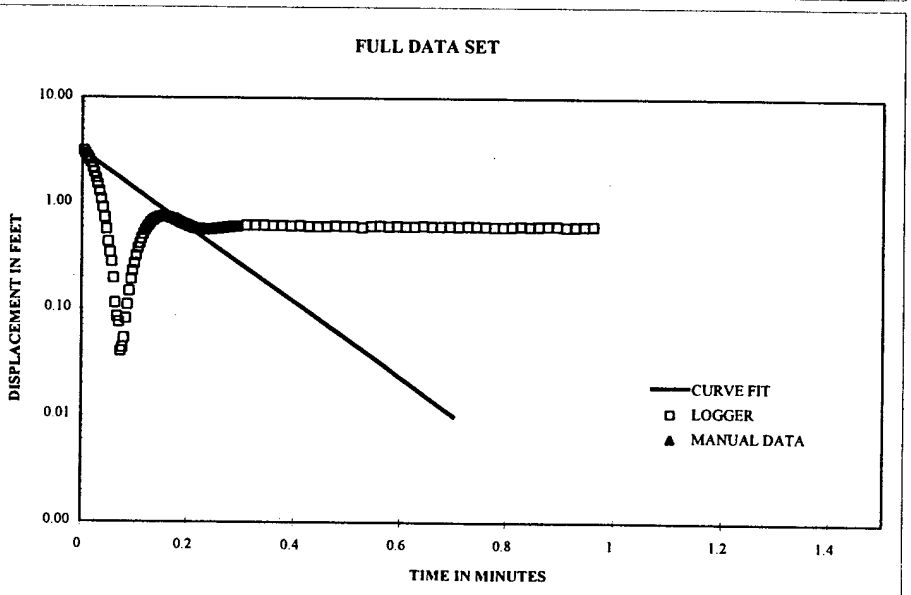
1.09E-02	cm/sec
2.14E-02	ft/min
30.86	ft/day

Casing stickup	0.00	feet
Static water level (from top of casing)	11.77	feet
Depth to bottom of screen (from ground level)	64.69	feet
Boring diameter	8.00	inches
Casing diameter	2.00	inches
Screen diameter	2.00	inches
Screen length	5.00	feet
Depth to "impermeable boundary"	75.00	feet
Porosity of filter pack		
Slug diameter (optional)	1.65	inches
Slug length (optional)	5.20	feet
Theoretical ΔH at time zero (Y_0)	3.54	feet
Actual ΔH at time zero (Y_0)	3.100	feet
ΔH at time t (Y_t)	0.010	feet
Time	0.70	min

Bouwer-Rice Parameters

feet	cm		cm	
11.77	358.75	*SW*		
52.92	1613.00	*H*	60.00	*L/Rw*
59.69	1819.35	*Ts*	0.84	*H/D*
0.083	2.54	*Rw*	3.30	*A*
0.083	2.54	*Rc*	0.50	*B*
0.167	5.08	*DS*	2.90	*C*
5.00	152.40	*L*	4.82	*Ln[(D-H)/Rw]'*
63.23	1927.25	*D*	4.82	*Ln[(D-H)/Rw]*
3.09999999	94.49	Y_o	3.77	equation (8)
0.01	0.30	Y_t	4.57	equation (9)
	42.00	*t (seconds)*	3.77	*Ln(Re/Rw)*
	0.00	*n*	1.1E-02	equation (5)





Bouwer, Herman. 1989. "The Bouwer and Rice Slug Test - An Update". Ground Water vol. 27, no. 3, May-June 1989.

Bouwer, H. and R.C. Rice. 1976. A Slug Test for Determining Hydraulic Conductivity of Unconfined Aquifers With Completely or Partially Penetrating Wells". Water Resources Research. vol 12, no. 3, June 1976.

SE1000C
Environmental Logger
06/27 11:14

Unit# 01579 Test 3

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	00152
Reference	0.000
Linearity	0.030
Scale factor	9.970
Offset	0.020
Delay mSEC	50.000

Step 0 06/27 09:50:24

Elapsed Time	INPUT 1
0.0000	0.113
0.0033	0.097
0.0066	0.100
0.0100	0.085
0.0133	0.078
0.0166	0.189
0.0200	0.110
0.0233	0.037
0.0266	0.422
0.0300	2.020
0.0333	2.565
0.0366	2.301
0.0400	2.335
0.0433	2.610
0.0466	2.436
0.0500	2.263
0.0533	2.071
0.0566	1.897
0.0600	1.664
0.0633	1.443
0.0666	1.226
0.0700	1.008
0.0733	0.788
0.0766	0.592
0.0800	0.406

0.0833	0.230
0.0866	0.069
0.0900	-0.069
0.0933	-0.157
0.0966	-0.220
0.1000	-0.305
0.1033	-0.387
0.1066	-0.416
0.1100	-0.425
0.1133	-0.460
0.1166	-0.457
0.1200	-0.447
0.1233	-0.419
0.1266	-0.391
0.1300	-0.353
0.1333	-0.309
0.1366	-0.271
0.1400	-0.230
0.1433	-0.182
0.1466	-0.123
0.1500	-0.082
0.1533	-0.037
0.1566	0.009
0.1600	0.053
0.1633	0.088
0.1666	0.119
0.1700	0.151
0.1733	0.179
0.1766	0.198
0.1800	0.220
0.1833	0.230
0.1866	0.242
0.1900	0.245
0.1933	0.252
0.1966	0.245
0.2000	0.245
0.2033	0.236
0.2066	0.230
0.2100	0.220
0.2133	0.220
0.2166	0.198
0.2200	0.189
0.2233	0.176
0.2266	0.163
0.2300	0.151
0.2333	0.138
0.2366	0.132
0.2400	0.122

0.2433	0.107
0.2466	0.100
0.2500	0.094
0.2533	0.082
0.2566	0.082
0.2600	0.075
0.2633	0.078
0.2666	0.069
0.2700	0.072
0.2733	0.069
0.2766	0.066
0.2800	0.066
0.2833	0.069
0.2866	0.069
0.2900	0.072
0.2933	0.078
0.2966	0.082
0.3000	0.082
0.3033	0.085
0.3066	0.085
0.3100	0.088
0.3133	0.094
0.3166	0.097
0.3200	0.097
0.3233	0.100
0.3266	0.104
0.3300	0.104
0.3333	0.104
0.3500	0.122
0.3666	0.122
0.3833	0.122
0.4000	0.116
0.4166	0.116
0.4333	0.113
0.4500	0.116
0.4666	0.107
0.4833	0.104
0.5000	0.110
0.5166	0.116
0.5333	0.110
0.5500	0.110
0.5666	0.097
0.5833	0.113
0.6000	0.116
0.6166	0.110
0.6333	0.113
0.6500	0.110
0.6666	0.110

0.6833	0.116
0.7000	0.110
0.7166	0.110
0.7333	0.113
0.7500	0.110
0.7666	0.113
0.7833	0.113
0.8000	0.107
0.8166	0.104
0.8333	0.104
0.8500	0.110
0.8666	0.116
0.8833	0.107
0.9000	0.113
0.9166	0.116
0.9333	0.116
0.9500	0.104
0.9666	0.107
0.9833	0.113
1.0000	0.116

APPENDIX D

DATA QUALITY ASSESSMENT REPORTS

PHASE I

APPENDIX C
DATA QUALITY ASSESMENT REPORT FOR DATA COLLECTED IN PHASE I
EAKER AFB

C1.0 INTRODUCTION

A Parsons Engineering Science electronic Level III validation was performed for Eaker Air Force Base (AFB) and consisted of electronically examining data deliverables to determine data quality. This included application of data qualifiers to the analytical results based on adherence to method protocols and project-specific quality assurance/quality control (QA/QC) limits. Method protocols reviewed included:

- analytical holding times,
- method blanks (MB),
- trip blanks (TB),
- surrogate spikes,
- matrix spikes/matrix spike duplicates (MS/MSDs),
- laboratory control samples (LCSs), and
- database laboratory flag review.

Data qualifiers were applied to analytical results during the data validation process. All data were validated using method applicable guidelines and in accordance with the *National Functional Guidelines for Organic Data Review* (USEPA, 1994a) and the *National Functional Guidelines for Inorganic Data Review* (USEPA, 1994b).

The following definitions provide explanations of the USEPA (1994a and 1994b) qualifiers assigned to analytical results during data validation. The data qualifiers described were applied to both inorganic and organic results.

U - The analyte was analyzed for and is not present above the reported sample quantitation limit (SQL).

J - The analyte was analyzed for and was positively identified, but the associated numerical value may not be consistent with the amount actually present in the environmental sample. The data should be considered as a basis for decision-making and are usable for many purposes.

R - The data are rejected as unusable for all purposes. The analyte was analyzed for, but the presence or absence of the analyte was not verified. Resampling and reanalysis are necessary to confirm the presence or absence of the analyte.

UJ - The analyte analyzed for was not present above the reported SQL. The associated numerical value may not accurately or precisely represent the concentration necessary to detect the analyte in the sample.

J1 The analyte is qualified as an estimated value solely because it is greater than the method detection limit (MDL) and less than the PQL indicating no laboratory quality issues.

C2.0 DATA QUALITY

Data quality for each QC parameter where exceptions were noted during the validation is summarized in this section. Only results that exceeded QA/QC criteria are presented. All frequency requirements for field sample collection of QA/QC samples (MS/MSDs and blanks) were met. The frequency requirements for laboratory specific method criteria QA/QC were met overall. In Attachment A, Tables A-1 and A-2 present the analytical methods performed for each samples and the samples that were qualified during the validation process, respectively.

C2.1 Preparation Blanks

Table C2.1-1 lists all results for target analytes that are out of control with the percentage of out-of-control results calculated against the total number of samples collected. Prep blank contaminant levels were sufficiently high to affect gasoline range total petroleum hydrocarbon (TPH) requiring application of qualifiers. The out-of-control results are believed to be due to laboratory error.

Table C2.1-1
Out-Of-Control Preparation Blank Impact

Anal. Method	Prep. Method	Matrix	Analyte	Flag	# of Qualified Results	Total Number of Samples	Percent of Results Qualified
M8015V	SW5030	SO	Gasoline Range Organics	U	10	26	38%

C2.2 Laboratory Control Samples

Table C2.2-1-1 lists all results for target analytes that are out of control with the percentage of out of control results calculated against the total number of samples collected. The LCS/LCSD relative percent difference (RPD) for one analytical batch was out of control causing the associated data to be qualified. The out-of-control LCS RPD are most likely due to laboratory error.

Table C2.2-1
Out-Of-Control Laboratory Control Sample Impact

Anal. Method	Prep. Method	Matrix	Analyte	Flag	# of Qualified Results	Total Number of Samples	Percent of Results Qualified
M8015D	SW3550	SO	Diesel Range Organics	J	15	26	58%

C2.3 Surrogate Spikes

Table C2.3-1-1 lists all results for target analytes that are out of control with the percentage of out of control results calculated against the total number of samples collected. Methods M8015, SW8020, and SW8310 displayed surrogate recovery problems. In most cases, the concentrations of target compounds in the qualified samples were high and required diluting. As a result, the surrogate concentrations were diluted to less than detectable concentrations. The samples were qualified as estimated because surrogate recoveries could not be calculated.

Table C2.3-1
Out-Of-Control Surrogate Spike Impact

Anal. Method	Prep. Method	Matrix	Analyte	Flag	# of Qualified Results	Total Number of Samples	Percent of Results Qualified
M8015D	SW3510	WG	Diesel Range Organics	J	2	3	67%
M8015D	SW3550	SO	Diesel Range Organics	J	3	26	12%
M8015V	SW5030	SO	Gasoline Range Organics	J	3	26	12%
M8015V	SW5030	WG	Gasoline Range Organics	J	1	3	33%
SW8020	SW5030	SO	1,2-Dichlorobenzene	UJ	3	26	12%

Table C2.3-1 (Continued)
Out-Of-Control Surrogate Spike Impact

SW8020	SW5030	SO	1,3-Dichlorobenzene	UJ	3	26	12%
SW8020	SW5030	SO	1,4-Dichlorobenzene	UJ	3	26	12%
SW8020	SW5030	SO	Benzene	J	1	26	4%
SW8020	SW5030	SO	Benzene	UJ	2	26	8%
SW8020	SW5030	SO	Chlorobenzene	UJ	3	26	12%
SW8020	SW5030	SO	Ethylbenzene	J	2	26	8%
SW8020	SW5030	SO	Ethylbenzene	UJ	1	26	4%
SW8020	SW5030	SO	Toluene	J	1	26	4%
SW8020	SW5030	SO	Toluene	UJ	2	26	8%
SW8020	SW5030	SO	Xylenes (total)	J	2	26	8%
SW8020	SW5030	SO	Xylenes (total)	UJ	1	26	4%
SW8310	SW3510	WG	Acenaphthene	UJ	2	2	100%
SW8310	SW3510	WG	Acenaphthylene	UJ	2	2	100%
SW8310	SW3510	WG	Anthracene	J	2	2	100%
SW8310	SW3510	WG	Benzo(a)anthracene	UJ	2	2	100%
SW8310	SW3510	WG	Benzo(a)pyrene	UJ	2	2	100%
SW8310	SW3510	WG	Benzo(b)fluoranthene	UJ	2	2	100%
SW8310	SW3510	WG	Benzo(ghi)perylene	UJ	2	2	100%
SW8310	SW3510	WG	Benzo(k)fluoranthene	UJ	2	2	100%
SW8310	SW3510	WG	Chrysene	UJ	2	2	100%
SW8310	SW3510	WG	Dibenzo(a,h)anthracene	UJ	2	2	100%
SW8310	SW3510	WG	Fluoranthene	J	2	2	100%
SW8310	SW3510	WG	Fluorene	UJ	2	2	100%
SW8310	SW3510	WG	Indeno(1,2,3-cd)pyrene	UJ	2	2	100%
SW8310	SW3510	WG	Naphthalene	J	2	2	100%
SW8310	SW3510	WG	Phenanthrene	J	2	2	100%
SW8310	SW3510	WG	Pyrene	UJ	2	2	100%

C2.4 Technical Holding Time

The pH of one sample was recorded at the time of analysis as pH 7. The samples for method SW8020 should be preserved with hydrochloric acid to a pH of <2 or be analyzed within seven days. The sample was analyzed after 10 days (because the laboratory assumed it had been properly preserved). Therefore, the results for the sample were qualified as estimated.

Table C2.4-1
Out-Of-Control Holding Time Impact

Anal. Method	Prep. Method	Matrix	Analyte	Flag	# of Qualified Results	Total Number of Samples	Percent of Results Qualified
SW8020	SW5030	WG	1,2-Dichlorobenzene	UJ	1	3	33%
SW8020	SW5030	WG	1,3-Dichlorobenzene	UJ	1	3	33%
SW8020	SW5030	WG	1,4-Dichlorobenzene	UJ	1	3	33%
SW8020	SW5030	WG	Benzene	UJ	1	3	33%
SW8020	SW5030	WG	Chlorobenzene	UJ	1	3	33%
SW8020	SW5030	WG	Ethylbenzene	UJ	1	3	33%
SW8020	SW5030	WG	Toluene	J	1	3	33%
SW8020	SW5030	WG	Xylenes (total)	J	1	3	33%

C2.5 Hardcopy Data Review

Methods M8015, SW8020, and SW8310 displayed matrix spike recovery problems. In most cases, the concentrations of target compounds in the qualified samples were high and required diluting. As a result, the matrix spike concentrations were diluted to less than detectable concentrations. The samples were not qualified because matrix spike recoveries could not be calculated.

C3.0 CONCLUSIONS

Samples were collected and analyzed as specified in the methods with exception of those issues discussed in this report. All samples are representative of the site and comparable with previous and future investigations (when used in accordance with the validation qualifiers). All sample results qualified as "U, UJ, J, or J1" represent an association to non-compliant QC criteria which has caused the reported concentration to be estimated. Project objectives do not exclude the use of estimated concentrations. No data was rejected based on the validation. Therefore, all the data is usable for the purposes intended.

C4.0 REFERENCES

U.S. Environmental Protection Agency (USEPA). 1983. Methods for the Chemical Analysis of Water and Wastes. EPA 600/4-79-020. Cincinnati, OH.

USEPA. 1993. Data Quality Objectives Process for Superfund. EPA 540-R-93-071. Washington, DC. September, 1993.

USEPA. 1987-1996. SW-846, Test Methods for Evaluating Solid Waste, Physical and Chemical Methods, Third Edition. Washington, DC.

USEPA. 1994a. Agency National Functional Guidelines for Organic Data Review. PB 94-963502. Washington, DC.

USEPA. 1994b. Agency National Functional Guidelines for Inorganic Data Review. PB 94-963501. Washington, DC.

ATTACHMENT A

VALIDATED SAMPLES AND QUALIFIED ANALYTICAL RESULTS

VALIDATED SAMPLES AND QUALIFIED ANALYTICAL RESULTS

Tables A-1 and A-2 list all qualified Eaker sample data based on the results of data validation. The following definitions of column headers will aide in the understanding and use of these tables.

LOCID: Sample location identifier, unique to each sample when used in conjunction of columns SBD and SED.

MX: Sample matrix identifier. "SO" is soil, "WG" is water.

SA: Sample analysis identifier. "N" is for primary field samples, "FR" is for field replicate samples. "N1" or "FR1" designates that the results associate to the original sample analysis. "N8" or "FR8" designates that the results associate to a composite of sample analysis results.

SBD: Sample beginning depth.

SED: Sample ending depth.

COMPOUND NAME: This column identifies the target compound name.

VQ: This column designates if a target compound was detected or not. An "=" denotes a detection above the project practical quantitation limit. A "ND" denotes a non-detection above the method detection limit. A "TR" denotes a detection above the method detection limit but below the project practical quantitation limit.

PARVAL: This is the concentration of detection for all detected sample results (TR or =). A zero is a placeholder, which associates to a non-detected compound. The zero does not imply that the compound was not detected at less than zero.

LABDL: This is the concentration at which the laboratory reports the project reporting limit. The project reporting limit is a practical quantitation limit in that it is related to a multiplier of the method detection limit.

ANMCODE: Analytical method code identifier.

EXMCODE: Analytical extraction method code identifier.

Q: This column represents the final validation qualifier applied to the sample result. It is a composite of all the validation qualifiers for that sample result.

The following column headers apply to the method criteria that are included in a data validation. All of the columns may not appear in Table XX5.0-1. Only those method criteria that resulted in qualifying sample results are listed.

HTM	Holding Time
MBM	Method Blank
TBM	Trip Blanks
CBM	Calibration Blank
EBM	Equipment Blanks
ABM	Ambient Blanks
MSRM	MS/MSD (%Recovery/Accuracy)
MSPM	MS/MSD (%RPD/Precision)
LCRM	LCS (%Recovery/Accuracy)
LCPM	LCS (%RPD/Precision)
SURM	Surrogate
RAM	Linear Range

CCPM	Compound Confirmation Precision
CIDM	Compound Identification
ICLM	Initial Calibration
ICVM	Initial Calibration Verification
CCVM	Continuing Calibration
TUNM	GC/MS Tuning
IPM	Instrument Performance
ICSM	Interference Check Sample
LRM	Laboratory Duplicate
PDSM	Post Digestion Spike
MSAM	Method of Standard Additions
SDM	Serial Dilution
ISM	Internal Standard
TMPM	Temperature
PRSM	Preservation
3REP	% RSD for 3 ICP Burns
QNTM	Compound Quantitation

The following flags have been included with the validation qualifiers to help determine the magnitude of the exceeded criteria where possible.

>	Greater than upper control limit (CL)
<	Less than lower CL but greater than two times lower CL

ATTACHMENT A

VALIDATED SAMPLES AND QUALIFIED ANALYTICAL RESULTS

TABLE A1 ANALYTICAL METHODS BY SAMPLE LOCATION								
LOCID	SBD	SED	MATRIX	E160_3	M8015D	M8015V	SW8020	SW8310
DT-1	4	12	SO	X	X	X	X	X
DT-1-GW	0	0	WG		X	X	X	X
DT-2	4	6	SO	X	X	X	X	X
DT-3	3	8	SO	X	X	X	X	X
DT-4	14	16	SO	X	X	X	X	X
P-1	3	4	SO	X	X	X	X	
P-10	3	8	SO	X	X	X	X	
P-11	3	4	SO	X	X	X	X	
P-12	3	4	SO	X	X	X	X	
P-13	3	4	SO	X	X	X	X	X
P-2	3	4	SO	X	X	X	X	
P-3	3	4	SO	X	X	X	X	
P-4	3	4	SO	X	X	X	X	
P-5	3	4	SO	X	X	X	X	
P-6	3	4	SO	X	X	X	X	
P-8	3	4	SO	X	X	X	X	X
P-9	3	4	SO	X	X	X	X	
RT-1	13	14	SO	X	X	X	X	
RT-2	7	8	SO	X	X	X	X	
RT-3	7	8	SO	X	X	X	X	
RT-4	7	8	SO	X	X	X	X	
UT-1	11.5	13	SO	X	X	X	X	
UT-2	6	8	SO	X	X	X	X	
UT-2-GW	0	0	WG		X	X	X	
UT-3	7	9	SO	X	X	X	X	
UT-4	7	9	SO	X	X	X	X	

TABLE A2
QUALIFIED ANALYTICAL RESULTS

LOCID	SBD	SED	MATRIX	SACODE	ANMCODE	EXMCODE	ANALYTE	PARVQ	PARVAL	LABDL	UNITS	FINAL Q	AHTM	LCPM	MBM	SURM
DT-1-GW	0	0	WG	FD1	M8015D	SW3510	Diesel Range Organics	=	3.5	2.0	MG/L	J				J
DT-1-GW	0	0	WG	FD1	SW8310	SW3510	Acenaphthene	ND	0	10	UG/L	UJ				UJ
DT-1-GW	0	0	WG	FD1	SW8310	SW3510	Acenaphthylene	ND	0	10	UG/L	UJ				UJ
DT-1-GW	0	0	WG	FD1	SW8310	SW3510	Anthracene	=	1.6	1.0	UG/L	J				J
DT-1-GW	0	0	WG	FD1	SW8310	SW3510	Benzo(a)anthracene	ND	0	1.3	UG/L	UJ				UJ
DT-1-GW	0	0	WG	FD1	SW8310	SW3510	Benzo(a)pyrene	ND	0	2.3	UG/L	UJ				UJ
DT-1-GW	0	0	WG	FD1	SW8310	SW3510	Benzo(b)fluoranthene	ND	0	1.8	UG/L	UJ				UJ
DT-1-GW	0	0	WG	FD1	SW8310	SW3510	Benzo(ghi)perylene	ND	0	2.0	UG/L	UJ				UJ
DT-1-GW	0	0	WG	FD1	SW8310	SW3510	Benzo(k)fluoranthene	ND	0	1.7	UG/L	UJ				UJ
DT-1-GW	0	0	WG	FD1	SW8310	SW3510	Chrysene	ND	0	2.0	UG/L	UJ				UJ
DT-1-GW	0	0	WG	FD1	SW8310	SW3510	Dibenzo(a,h)anthracene	ND	0	3.0	UG/L	UJ				UJ
DT-1-GW	0	0	WG	FD1	SW8310	SW3510	Fluoranthene	=	3	2.0	UG/L	J				J
DT-1-GW	0	0	WG	FD1	SW8310	SW3510	Fluorene	ND	0	2.0	UG/L	UJ				UJ
DT-1-GW	0	0	WG	FD1	SW8310	SW3510	Indeno(1,2,3-cd)pyrene	ND	0	4.3	UG/L	UJ				UJ
DT-1-GW	0	0	WG	FD1	SW8310	SW3510	Naphthalene	=	580	10	UG/L	J				J
DT-1-GW	0	0	WG	FD1	SW8310	SW3510	Phenanthrene	=	11	2.0	UG/L	J				J
DT-1-GW	0	0	WG	FD1	SW8310	SW3510	Pyrene	ND	0	2.0	UG/L	UJ				UJ
DT-1-GW	0	0	WG	N1	M8015D	SW3510	Diesel Range Organics	=	3.1	2.0	MG/L	J				J
DT-1-GW	0	0	WG	N1	SW8310	SW3510	Acenaphthene	ND	0	10	UG/L	UJ				UJ
DT-1-GW	0	0	WG	N1	SW8310	SW3510	Acenaphthylene	ND	0	10	UG/L	UJ				UJ
DT-1-GW	0	0	WG	N1	SW8310	SW3510	Anthracene	=	1.3	1.0	UG/L	J				J
DT-1-GW	0	0	WG	N1	SW8310	SW3510	Benzo(a)anthracene	ND	0	1.3	UG/L	UJ				UJ
DT-1-GW	0	0	WG	N1	SW8310	SW3510	Benzo(a)pyrene	ND	0	2.3	UG/L	UJ				UJ
DT-1-GW	0	0	WG	N1	SW8310	SW3510	Benzo(b)fluoranthene	ND	0	1.8	UG/L	UJ				UJ
DT-1-GW	0	0	WG	N1	SW8310	SW3510	Benzo(ghi)perylene	ND	0	2.0	UG/L	UJ				UJ
DT-1-GW	0	0	WG	N1	SW8310	SW3510	Benzo(k)fluoranthene	ND	0	1.7	UG/L	UJ				UJ
DT-1-GW	0	0	WG	N1	SW8310	SW3510	Chrysene	ND	0	2.0	UG/L	UJ				UJ
DT-1-GW	0	0	WG	N1	SW8310	SW3510	Dibenzo(a,h)anthracene	ND	0	3.0	UG/L	UJ				UJ
DT-1-GW	0	0	WG	N1	SW8310	SW3510	Fluoranthene	=	2.4	2.0	UG/L	J				J
DT-1-GW	0	0	WG	N1	SW8310	SW3510	Fluorene	ND	0	2.0	UG/L	UJ				UJ
DT-1-GW	0	0	WG	N1	SW8310	SW3510	Indeno(1,2,3-cd)pyrene	ND	0	4.3	UG/L	UJ				UJ
DT-1-GW	0	0	WG	N1	SW8310	SW3510	Naphthalene	=	500	10	UG/L	J				J
DT-1-GW	0	0	WG	N1	SW8310	SW3510	Phenanthrene	=	9.6	2.0	UG/L	J				J
DT-1-GW	0	0	WG	N1	SW8310	SW3510	Pyrene	ND	0	2.0	UG/L	UJ				UJ
DT-2	4	6	SO	N1	M8015V	SW5030	Gasoline Range Organics	=	100	5.6	MG/KG	J				J
DT-2	4	6	SO	N1	SW8020	SW5030	1,2-Dichlorobenzene	ND	0	0.022	MG/KG	UJ				UJ
DT-2	4	6	SO	N1	SW8020	SW5030	1,3-Dichlorobenzene	ND	0	0.022	MG/KG	UJ				UJ
DT-2	4	6	SO	N1	SW8020	SW5030	1,4-Dichlorobenzene	ND	0	0.017	MG/KG	UJ				UJ
DT-2	4	6	SO	N1	SW8020	SW5030	Benzene	ND	0	0.0056	MG/KG	UJ				UJ
DT-2	4	6	SO	N1	SW8020	SW5030	Chlorobenzene	ND	0	0.011	MG/KG	UJ				UJ

TABLE A2
QUALIFIED ANALYTICAL RESULTS

LOCID	SBD	SED	MATRIX	SACODE	ANMCODE	EXMCODE	ANALYTE	PARVQ	PARVAL	LABDL	UNITS	FINAL Q	AHTM	LCPM	MBM	SURM
DT-2	4	6	SO	N1	SW8020	SW5030	Ethylbenzene	=	2.4	0.011	MG/KG	J				J
DT-2	4	6	SO	N1	SW8020	SW5030	Toluene	ND	0	0.011	MG/KG	UJ				UJ
DT-2	4	6	SO	N1	SW8020	SW5030	Xylenes (total)	=	1.5	0.011	MG/KG	J				J
DT-3	3	8	SO	FR1	M8015D	SW3550	Diesel Range Organics	=	78	46	MG/KG	J				J
DT-4	14	16	SO	N1	M8015V	SW5030	Gasoline Range Organics	TR	0.55	1.4	MG/KG	U			U	
P-1	3	4	SO	N1	M8015D	SW3550	Diesel Range Organics	=	15	4.6	MG/KG	J		J		
P-1	3	4	SO	N1	M8015V	SW5030	Gasoline Range Organics	=	1.3	1.2	MG/KG	U			U	
P-10	3	8	SO	N1	M8015D	SW3550	Diesel Range Organics	=	51	4.9	MG/KG	J		J		
P-10	3	8	SO	N1	M8015V	SW5030	Gasoline Range Organics	=	150	6.1	MG/KG	J				J
P-10	3	8	SO	N1	SW8020	SW5030	1,2-Dichlorobenzene	ND	0	0.024	MG/KG	UJ				UJ
P-10	3	8	SO	N1	SW8020	SW5030	1,3-Dichlorobenzene	ND	0	0.024	MG/KG	UJ				UJ
P-10	3	8	SO	N1	SW8020	SW5030	1,4-Dichlorobenzene	ND	0	0.018	MG/KG	UJ				UJ
P-10	3	8	SO	N1	SW8020	SW5030	Benzene	=	0.17	0.0061	MG/KG	J				J
P-10	3	8	SO	N1	SW8020	SW5030	Chlorobenzene	ND	0	0.012	MG/KG	UJ				UJ
P-10	3	8	SO	N1	SW8020	SW5030	Ethylbenzene	=	2.5	0.012	MG/KG	J				J
P-10	3	8	SO	N1	SW8020	SW5030	Toluene	=	1.4	0.012	MG/KG	J				J
P-10	3	8	SO	N1	SW8020	SW5030	Xylenes (total)	=	12	0.012	MG/KG	J				J
P-11	3	4	SO	N1	M8015D	SW3550	Diesel Range Organics	=	95	4.6	MG/KG	J		J		
P-12	3	4	SO	N1	M8015D	SW3550	Diesel Range Organics	=	41	4.5	MG/KG	J		J		
P-2	3	4	SO	N1	M8015D	SW3550	Diesel Range Organics	=	8	4.5	MG/KG	J		J		
P-2	3	4	SO	N1	M8015V	SW5030	Gasoline Range Organics	TR	0.75	1.2	MG/KG	U			U	
P-3	3	4	SO	N1	M8015D	SW3550	Diesel Range Organics	=	13	4.5	MG/KG	J		J		
P-3	3	4	SO	N1	M8015V	SW5030	Gasoline Range Organics	TR	0.46	1.1	MG/KG	U			U	
P-4	3	4	SO	N1	M8015D	SW3550	Diesel Range Organics	=	20	4.6	MG/KG	J		J		
P-4	3	4	SO	N1	M8015V	SW5030	Gasoline Range Organics	TR	0.37	1.2	MG/KG	U			U	
P-5	3	4	SO	N1	M8015D	SW3550	Diesel Range Organics	=	24	4.4	MG/KG	J		J		
P-5	3	4	SO	N1	M8015V	SW5030	Gasoline Range Organics	TR	0.3	1.1	MG/KG	U			U	
P-6	3	4	SO	FR1	M8015D	SW3550	Diesel Range Organics	=	480	46	MG/KG	J		J		J
P-6	3	4	SO	N1	M8015D	SW3550	Diesel Range Organics	=	390	46	MG/KG	J		J		J
P-8	3	4	SO	N1	M8015D	SW3550	Diesel Range Organics	=	18	4.8	MG/KG	J		J		
P-9	3	4	SO	N1	M8015D	SW3550	Diesel Range Organics	=	15	4.7	MG/KG	J		J		
P-9	3	4	SO	N1	M8015V	SW5030	Gasoline Range Organics	TR	0.94	1.2	MG/KG	U			U	
UT-1	11.5	13	SO	N1	M8015D	SW3550	Diesel Range Organics	=	52	4.2	MG/KG	J		J		
UT-1	11.5	13	SO	N1	M8015V	SW5030	Gasoline Range Organics	=	160	5.3	MG/KG	J				J
UT-1	11.5	13	SO	N1	SW8020	SW5030	1,2-Dichlorobenzene	ND	0	0.026	MG/KG	UJ				UJ
UT-1	11.5	13	SO	N1	SW8020	SW5030	1,3-Dichlorobenzene	ND	0	0.026	MG/KG	UJ				UJ
UT-1	11.5	13	SO	N1	SW8020	SW5030	1,4-Dichlorobenzene	ND	0	0.016	MG/KG	UJ				UJ
UT-1	11.5	13	SO	N1	SW8020	SW5030	Benzene	ND	0	0.0053	MG/KG	UJ				UJ
UT-1	11.5	13	SO	N1	SW8020	SW5030	Chlorobenzene	ND	0	0.011	MG/KG	UJ				UJ
UT-1	11.5	13	SO	N1	SW8020	SW5030	Ethylbenzene	ND	0	0.011	MG/KG	UJ				UJ

TABLE A2

QUALIFIED ANALYTICAL RESULTS

LOCID	SBD	SED	MATRIX	SACODE	ANMCODE	EXMCODE	ANALYTE	PARVQ	PARVAL	LABDL	UNITS	FINAL Q	AHTM	LCPM	MBM	SURM
UT-1	11.5	13	SO	N1	SW8020	SW5030	Toluene	ND	0	0.011	MG/KG	UJ				UJ
UT-1	11.5	13	SO	N1	SW8020	SW5030	Xylenes (total)	ND	0	0.011	MG/KG	UJ				UJ
UT-2	6	8	SO	N1	M8015D	SW3550	Diesel Range Organics	=	49	4.5	MG/KG	J		J		
UT-2	6	8	SO	N1	M8015V	SW5030	Gasoline Range Organics	=	1.1	1.1	MG/KG	U			U	
UT-2-GW	0	0	WG	N1	M8015V	SW5030	Gasoline Range Organics	=	500	100	UG/L	J				J
UT-2-GW	0	0	WG	N1	SW8020	SW5030	1,2-Dichlorobenzene	ND	0	4.0	UG/L	UJ	UJ			
UT-2-GW	0	0	WG	N1	SW8020	SW5030	1,3-Dichlorobenzene	ND	0	4.0	UG/L	UJ	UJ			
UT-2-GW	0	0	WG	N1	SW8020	SW5030	1,4-Dichlorobenzene	ND	0	3.0	UG/L	UJ	UJ			
UT-2-GW	0	0	WG	N1	SW8020	SW5030	Benzene	ND	0	2.0	UG/L	UJ	UJ			
UT-2-GW	0	0	WG	N1	SW8020	SW5030	Chlorobenzene	ND	0	2.0	UG/L	UJ	UJ			
UT-2-GW	0	0	WG	N1	SW8020	SW5030	Ethylbenzene	ND	0	2.0	UG/L	UJ	UJ			
UT-2-GW	0	0	WG	N1	SW8020	SW5030	Toluene	TR	1.3	2.0	UG/L	J	J			
UT-2-GW	0	0	WG	N1	SW8020	SW5030	Xylenes (total)	=	2.2	2.0	UG/L	J	J			
UT-3	7	9	SO	N1	M8015D	SW3550	Diesel Range Organics	=	5.1	5.0	MG/KG	J		J		
UT-3	7	9	SO	N1	M8015V	SW5030	Gasoline Range Organics	TR	0.22	1.2	MG/KG	U			U	
UT-4	7	9	SO	N1	M8015V	SW5030	Gasoline Range Organics	=	1.4	1.3	MG/KG	U			U	

PHASE II

APPENDIX C
DATA QUALITY ASSESMENT REPORT FOR DATA COLLECTED IN PHASE II
EAKER AIR FORCE BASE

C1.0 INTRODUCTION

A Parsons Engineering Science electronic Level III validation was performed for Eaker Air Force Base (AFB) and consisted of electronically examining data deliverables to determine data quality. This included application of data qualifiers to the analytical results based on adherence to method protocols and project-specific quality assurance/quality control (QA/QC) limits. Method protocols reviewed included:

- analytical holding times,
- method blanks (MB),
- trip blanks (TB),
- surrogate spikes,
- matrix spikes/matrix spike duplicates (MS/MSDs),
- laboratory control samples (LCSs), and
- hardcopy data review.

Data qualifiers were applied to analytical results during the data validation process. All data were validated using method applicable guidelines and in accordance with the *National Functional Guidelines for Organic Data Review* (USEPA, 1994a) and the *National Functional Guidelines for Inorganic Data Review* (USEPA, 1994b).

The following definitions provide explanations of the USEPA (1994a and 1994b) qualifiers assigned to analytical results during data validation. The data qualifiers described were applied to both inorganic and organic results.

U - The analyte was analyzed for and is not present above the reported sample quantitation limit (SQL).

J - The analyte was analyzed for and was positively identified, but the associated numerical value may not be consistent with the amount actually present in the environmental sample. The data should be considered as a basis for decision-making and are usable for many purposes.

R - The data are rejected as unusable for all purposes. The analyte was analyzed for, but the presence or absence of the analyte was not verified. Resampling and reanalysis are necessary to confirm the presence or absence of the analyte.

UJ - The analyte analyzed for was not present above the reported SQL. The associated numerical value may not accurately or precisely represent the concentration necessary to detect the analyte in the sample.

J1 The analyte is qualified as an estimated value solely because it is greater than the method detection limit (MDL) and less than the PQL indicating no laboratory quality issues.

C2.0 DATA QUALITY

Data quality for each QC parameter where problems were noted during the validation is summarized in this section. Only results that exceeded QA/QC criteria are presented. All frequency requirements for field sample collection of QA/QC samples (field duplicates, MS/MSDs, and blanks) were met. The frequency requirements for laboratory specific method criteria QA/QC were met overall. In Attachment A, Tables A-1 and A-2 present the analytical methods performed for each samples and the samples that were qualified during the validation process, respectively.

C2.1 Surrogate Spikes

Table C2.1 lists all results for target analytes that are out of control with the percentage of out of control results calculated against the total number of samples collected. For methods M8015V, SW8021, and SW8310 the surrogate spikes were diluted out because of high target compound concentrations. As a result, the sample results were qualified as estimated. For method M8015D, the surrogate recovery was high. Therefore, a high bias is expected in the sample result for the TPH diesel range organics.

Table C2.1
Out-Of-Control Surrogate Spike Impact

Anal. Method	Prep. Method	Matrix	Analyte	Flag	# of Qualified Results	Total Number of Samples	Percent of Results Qualified
M8015D	SW3550	SO	Diesel Range Organics	J	1	16	6%
M8015V	SW5030	SO	Gasoline Range Organics	J	2	16	13%
M8015V	SW5030	SO	Gasoline Range Organics	UJ	3	16	19%
SW8021	SW5030	SO	Benzene	J	4	16	25%
SW8021	SW5030	SO	Benzene	UJ	1	16	6%
SW8021	SW5030	SO	Ethylbenzene	J	4	16	25%
SW8021	SW5030	SO	Ethylbenzene	UJ	1	16	6%
SW8021	SW5030	SO	Methyl tert-butyl ether	UJ	6	18	33%
SW8021	SW5030	SO	Toluene	J	4	16	25%
SW8021	SW5030	SO	Toluene	UJ	1	16	6%
SW8021	SW5030	SO	Xylenes (total)	J	4	16	25%
SW8021	SW5030	SO	Xylenes (total)	UJ	1	16	6%
SW8310	SW3510	WG	Benzo(a)pyrene	UJ	4	13	31%
SW8310	SW3510	WG	Naphthalene	J	6	15	33%

C2.2 Method Blanks

Table C2.2 lists all results for target compounds that are out of control due to method blank contamination with the percentage of out-of-control results calculated against the total number of samples collected. Nitrate-nitrite nitrogen was found in one method blank resulting in four sample qualifications. Methane was detected in three method blanks and resulted in four sample qualifications. The blank contamination is probably due to laboratory error.

Table C2.2
Out-Of-Control Method Blank Impact

Anal. Method	Prep. Method	Matrix	Analyte	Flag	# of Qualified Results	Total Number of Samples	Percent of Results Qualified
E353.2	METHOD	WG	Nitrate-Nitrite	U	4	14	29%
M2720C	METHOD	WG	Methane	U	4	22	18%

C2.3 Field Duplicates

Table C2.3 lists the field duplicate results for compounds where at least one sample in the duplicate pair was detected. The relative percent difference (RPD) for most compounds was high. Because the sampling technique involved collecting soils duplicates from two adjacent intervals in the borehole, the samples collected are not true duplicates. The non-homogeneous nature of the soil matrix also adds variation to the duplicate results. The data is not qualified based on field duplicate results.

Table C2.3
Field Duplicates

Location	Matrix	SBD	SED	Anal. Method	Prep. Method	Sample Dup Result	Sample Result	LAB DL	RPD	Range	Units	Analyte
74SB006004	SO	0	0	SW8021	SW5030	0	0.0024	0.012		0.0024	MG/KG	Benzene
74SB006004	SO	0	0	SW8021	SW5030	0	0.013	0.012		0.013	MG/KG	Ethylbenzene
SB008-004	SO	0	0	M8015V	SW5030	0	8	64		8	MG/KG	Gasoline Range Organics
SB008-004	SO	0	0	SW8021	SW5030	7.8	0	1.3	200%		MG/KG	Toluene
SB008-004	SO	0	0	SW8021	SW5030	8.2	0	1.3	200%		MG/KG	Ethylbenzene
74SB006004	SO	0	0	M8015V	SW5030	0.63	1.1	1.2		0.47	MG/KG	Gasoline Range Organics
MW005-001	WG	0	0	E353.2	METHOD	0.03	0.048	0.1		0.018	MG/L	Nitrate-Nitrite
MW005-001	WG	0	0	M8015D	SW3510	0.044	0.044	1		0	MG/L	Diesel Range Organics
MW005-001	WG	0	0	M8015V	SW5030	0.072	0.072	0.1		0	MG/L	Gasoline Range Organics
GW003-001	WG	0	0	E353.2	METHOD	0.08	0.055	0.1		0.025	MG/L	Nitrate-Nitrite
GW003-001	WG	0	0	M8015D	SW3510	2.4	2.5	4		0.1	MG/L	Diesel Range Organics
GW003-001	WG	0	0	SW8310	SW3510	140	100	5.3	33%		UG/L	Naphthalene
SB008-004	SO	0	0	SW8021	SW5030	0.49	0.05	1.3		0.44	MG/KG	Benzene
SB008-004	SO	0	0	SW8021	SW5030	42	0.089	1.3	199%		MG/KG	Xylenes (total)

C2.4 Hardcopy Data Review

A review of the hardcopy data for one sample delivery group, revealed no additional analytical problems other than those noted in the preceding paragraphs. Transcription errors in reporting the data were discovered and resubmissions from the laboratory were requested.

C3.0 CONCLUSIONS

Samples were collected and analyzed as specified in the methods with exception of those issues discussed in this report. All samples are representative of the site and comparable with previous and future investigations (when used in accordance with the validation qualifiers). All sample results qualified as "U, UJ, or J" represent an association to non-compliant QC criteria which has caused the reported

concentration to be estimated. Project objectives do not exclude the use of estimated concentrations. No data was rejected based on the validation. Therefore, all the data is usable for the purposes intended.

C4.0 REFERENCES

U.S. Environmental Protection Agency (USEPA). 1983. Methods for the Chemical Analysis of Water and Wastes. EPA 600/4-79-020. Cincinnati, OH.

USEPA. 1993. Data Quality Objectives Process for Superfund. EPA 540-R-93-071. Washington, DC. September, 1993.

USEPA. 1987-1996. SW-846, Test Methods for Evaluating Solid Waste, Physical and Chemical Methods, Third Edition. Washington, DC.

USEPA. 1994a. Agency National Functional Guidelines for Organic Data Review. PB 94-963502. Washington, DC.

USEPA. 1994b. Agency National Functional Guidelines for Inorganic Data Review. PB 94-963501. Washington, DC.

ATTACHMENT A

VALIDATED SAMPLES AND QUALIFIED ANALYTICAL RESULTS

VALIDATED SAMPLES AND QUALIFIED ANALYTICAL RESULTS

Tables A-1 and A-2 list all qualified Eaker sample data based on the results of data validation. The following definitions of column headers will aide in the understanding and use of these tables.

LOCID: Sample location identifier, unique to each sample when used in conjunction of columns SBD and SED.

MX: Sample matrix identifier. "SO" is soil, "WG" is water.

SA: Sample analysis identifier. "N" is for primary field samples, "FR" is for field replicate samples. "N1" or "FR1" designates that the results associate to the original sample analysis. "N8" or "FR8" designates that the results associate to a composite of sample analysis results.

SBD: Sample beginning depth.

SED: Sample ending depth.

COMPOUND NAME: This column identifies the target compound name.

VQ: This column designates if a target compound was detected or not. An "=" denotes a detection above the project practical quantitation limit. A "ND" denotes a non-detection above the method detection limit. A "TR" denotes a detection above the method detection limit but below the project practical quantitation limit.

PARVAL: This is the concentration of detection for all detected sample results (TR or =). A zero is a placeholder, which associates to a non-detected compound. The zero does not imply that the compound was not detected at less than zero.

LABDL: This is the concentration at which the laboratory reports the project reporting limit. The project reporting limit is a practical quantitation limit in that it is related to a multiplier of the method detection limit.

ANMCODE: Analytical method code identifier.

EXMCODE: Analytical extraction method code identifier.

Q: This column represents the final validation qualifier applied to the sample result. It is a composite of all the validation qualifiers for that sample result.

The following column headers apply to the method criteria that are included in a data validation. All of the columns may not appear in Table A-2. Only those method criteria that resulted in qualifying sample results are listed.

HTM	Holding Time
MBM	Method Blank
TBM	Trip Blanks
CBM	Calibration Blank
EBM	Equipment Blanks
ABM	Ambient Blanks
MSRM	MS/MSD (%Recovery/Accuracy)
MSPM	MS/MSD (%RPD/Precision)
LCRM	LCS (%Recovery/Accuracy)
LCPM	LCS (%RPD/Precision)
SURM	Surrogate

TABLE A-1
ANALYTICAL METHODS BY SAMPLE LOCATION

LOCID	SBD	SED	MATRIX	E350.1	SW9056	E310.2	D2216	E160.3	E353.2	M2720C	M8015D	M8015V	SW8021	SW8310	SW9060
74MW010004	0	0	SO				X								X
74SB006003	0	0	SO				X				X	X	X	X	
74SB006004	0	0	SO				X				X	X	X	X	
74SB007004	0	0	SO				X				X	X	X	X	
74SB007005	0	0	SO				X				X	X	X	X	
GW002-001	0	0	WG						X	X	X	X	X	X	
GW003-001	0	0	WG						X	X	X	X	X	X	
GW004-001	0	0	WG						X	X	X	X	X	X	
GW006-001	0	0	WG						X	X	X	X	X	X	
GW007-001	0	0	WG						X	X	X	X	X	X	
GW008-001	0	0	WG						X	X	X	X	X	X	
GW009-001	0	0	WG						X		X			X	
GW011-001	0	0	WG						X	X	X	X	X	X	
GW012-001	0	0	WG						X	X	X	X	X	X	
MW001-001	0	0	WG						X	X	X	X	X	X	
MW005-001	0	0	WG						X	X	X	X	X	X	
MW009-001	0	0	WG							X		X	X		
MW009-004	0	0	SO					X							X
MW010-001	0	0	WG						X	X	X	X	X	X	
MW011-004	0	0	SO					X							X
MW012-002	0	0	WG	X	X	X			X	X	X	X	X	X	
SB001-002	0	0	SO					X					X		
SB001-004	0	0	SO					X			X	X	X	X	
SB001-006	0	0	SO					X			X	X	X	X	X
SB002-002	0	0	SO				X				X	X	X	X	
SB002-004	0	0	SO				X				X	X	X	X	
SB003-002	0	0	SO					X					X		

TABLE A-1
ANALYTICAL METHODS BY SAMPLE LOCATION

LOCID	SBD	SED	MATRIX	E350.1	SW9056	E310.2	D2216	E160.3	E353.2	M2720C	M8015D	M8015V	SW8021	SW8310	SW9060
SB003-004	0	0	SO					X			X	X	X	X	
SB003-006	0	0	SO					X			X	X	X	X	
SB004-002	0	0	SO				X				X	X	X	X	
SB005-004	0	0	SO				X				X	X	X	X	
SB008-004	0	0	SO				X				X	X	X	X	
SB008-005	0	0	SO				X				X	X	X	X	

TABLE A-2
QUALIFIED ANALYTICAL RESULTS

LOCID	SBD	SED	MATRIX	SACODE	ANMCODE	EXMCODE	COMPD_NAME	PARV Q	PARVAL	LABDL	UTMCODE	Final Q	MBM	SURM
GW002-001	0	0	WG	N1	SW8310	SW3510	Benzo(a)pyrene	ND	0	1	UG/L	UJ		UJ
GW002-001	0	0	WG	N1	SW8310	SW3510	Naphthalene	=	380	10	UG/L	J		J
GW003-001	0	0	WG	FD1	SW8310	SW3510	Naphthalene	=	140	5.3	UG/L	J		J
GW003-001	0	0	WG	N1	E353.2	METHOD	Nitrate-Nitrite	TR	0.055	0.1	MG/L	U	U	
GW003-001	0	0	WG	N1	SW8310	SW3510	Naphthalene	=	100	4	UG/L	J		J
GW004-001	0	0	WG	N1	E353.2	METHOD	Nitrate-Nitrite	=	0.15	0.1	MG/L	U	U	
GW004-001	0	0	WG	N1	SW8310	SW3510	Benzo(a)pyrene	ND	0	1	UG/L	UJ		UJ
GW004-001	0	0	WG	N1	SW8310	SW3510	Naphthalene	=	290	10	UG/L	J		J
GW006-001	0	0	WG	N1	M2720C	METHOD	Methane	TR	0.18	0.5	UG/L	U	U	
GW007-001	0	0	WG	N1	M2720C	METHOD	Methane	=	0.63	0.5	UG/L	U	U	
GW008-001	0	0	WG	N1	M2720C	METHOD	Methane	TR	0.21	0.5	UG/L	U	U	
GW009-001	0	0	WG	N1	E353.2	METHOD	Nitrate-Nitrite	=	0.13	0.1	MG/L	U	U	
GW011-001	0	0	WG	N1	E353.2	METHOD	Nitrate-Nitrite	=	0.16	0.1	MG/L	U	U	
GW011-001	0	0	WG	N1	M2720C	METHOD	Methane	=	0.96	0.5	UG/L	U	U	
GW012-001	0	0	WG	N1	SW8310	SW3510	Benzo(a)pyrene	ND	0	1	UG/L	UJ		UJ
GW012-001	0	0	WG	N1	SW8310	SW3510	Naphthalene	=	300	10	UG/L	J		J
SB003-002	0	0	SO	N1	SW8021	SW5030	Methyl tert-butyl ether	ND	0	6.4	MG/KG	UJ		UJ
SB003-004	0	0	SO	N1	M8015V	SW5030	Gasoline Range Organics	=	1400	64	MG/KG	J		J
SB003-004	0	0	SO	N1	SW8021	SW5030	Benzene	=	7.5	3.2	MG/KG	J		J
SB003-004	0	0	SO	N1	SW8021	SW5030	Ethylbenzene	=	23	3.2	MG/KG	J		J
SB003-004	0	0	SO	N1	SW8021	SW5030	Methyl tert-butyl ether	ND	0	3.2	MG/KG	UJ		UJ
SB003-004	0	0	SO	N1	SW8021	SW5030	Toluene	=	65	3.2	MG/KG	J		J
SB003-004	0	0	SO	N1	SW8021	SW5030	Xylenes (total)	=	120	3.2	MG/KG	J		J
SB003-006	0	0	SO	N1	M8015V	SW5030	Gasoline Range Organics	=	490	26	MG/KG	J		J
SB003-006	0	0	SO	N1	SW8021	SW5030	Benzene	=	4.2	1.3	MG/KG	J		J

TABLE A-2
QUALIFIED ANALYTICAL RESULTS

LOCID	SBD	SED	MATRIX	SACODE	ANMCODE	EXMCODE	COMPD_NAME	PARV Q	PARVAL	LABDL	UTMCODE	Final Q	MBM	SURM
SB003-006	0	0	SO	N1	SW8021	SW5030	Ethylbenzene	=	6.7	1.3	MG/KG	J		J
SB003-006	0	0	SO	N1	SW8021	SW5030	Methyl tert-butyl ether	ND	0	1.3	MG/KG	UJ		UJ
SB003-006	0	0	SO	N1	SW8021	SW5030	Toluene	=	21	1.3	MG/KG	J		J
SB003-006	0	0	SO	N1	SW8021	SW5030	Xylenes (total)	=	35	1.3	MG/KG	J		J
SB004-002	0	0	SO	N1	M8015D	SW3550	Diesel Range Organics	=	11	11	MG/KG	J		J
SB004-002	0	0	SO	N1	M8015V	SW5030	Gasoline Range Organics	ND	0	23	MG/KG	UJ		UJ
SB004-002	0	0	SO	N1	SW8021	SW5030	Benzene	ND	0	0.29	MG/KG	UJ		UJ
SB004-002	0	0	SO	N1	SW8021	SW5030	Ethylbenzene	ND	0	0.29	MG/KG	UJ		UJ
SB004-002	0	0	SO	N1	SW8021	SW5030	Methyl tert-butyl ether	ND	0	0.29	MG/KG	UJ		UJ
SB004-002	0	0	SO	N1	SW8021	SW5030	Toluene	ND	0	0.29	MG/KG	UJ		UJ
SB004-002	0	0	SO	N1	SW8021	SW5030	Xylenes (total)	ND	0	0.29	MG/KG	UJ		UJ
SB008-004	0	0	SO	FR1	M8015V	SW5030	Gasoline Range Organics	ND	0	64	MG/KG	UJ		UJ
SB008-004	0	0	SO	FR1	SW8021	SW5030	Benzene	TR	0.49	1.3	MG/KG	J		J
SB008-004	0	0	SO	FR1	SW8021	SW5030	Ethylbenzene	=	8.2	1.3	MG/KG	J		J
SB008-004	0	0	SO	FR1	SW8021	SW5030	Methyl tert-butyl ether	ND	0	1.3	MG/KG	UJ		UJ
SB008-004	0	0	SO	FR1	SW8021	SW5030	Toluene	=	7.8	1.3	MG/KG	J		J
SB008-004	0	0	SO	FR1	SW8021	SW5030	Xylenes (total)	=	42	1.3	MG/KG	J		J
SB008-005	0	0	SO	N1	M8015V	SW5030	Gasoline Range Organics	ND	0	260	MG/KG	UJ		UJ
SB008-005	0	0	SO	N1	SW8021	SW5030	Benzene	=	4.4	1.3	MG/KG	J		J
SB008-005	0	0	SO	N1	SW8021	SW5030	Ethylbenzene	=	39	1.3	MG/KG	J		J
SB008-005	0	0	SO	N1	SW8021	SW5030	Methyl tert-butyl ether	ND	0	1.3	MG/KG	UJ		UJ
SB008-005	0	0	SO	N1	SW8021	SW5030	Toluene	=	72	1.3	MG/KG	J		J
SB008-005	0	0	SO	N1	SW8021	SW5030	Xylenes (total)	=	220	1.3	MG/KG	J		J
MW012-002	0	0	WG	N1	SW8310	SW3510	Naphthalene	=	230	5	UG/L	J		J
MW012-002	0	0	WG	N1	SW8310	SW3510	Benzo(a)pyrene	ND	0	0.5	UG/L	UJ		UJ

PHASE III

APPENDIX C
DATA QUALITY ASSESMENT REPORT FOR DATA COLLECTED IN PHASE III
EAKER AIR FORCE BASE

C1.0 INTRODUCTION

A Parsons Engineering Science electronic Level III validation was performed for Eaker Air Force Base (AFB) and consisted of electronically examining data deliverables to determine data quality. This included application of data qualifiers to the analytical results based on adherence to method protocols and project-specific quality assurance/quality control (QA/QC) limits. Method protocols reviewed included:

- analytical holding times,
- method blanks (MB),
- trip blanks (TB),
- surrogate spikes,
- matrix spikes/matrix spike duplicates (MS/MSDs),
- laboratory control samples (LCSs), and
- hardcopy data review.

Data qualifiers were applied to analytical results during the data validation process. All data were validated using method applicable guidelines and in accordance with the *National Functional Guidelines for Organic Data Review* (USEPA, 1994a) and the *National Functional Guidelines for Inorganic Data Review* (USEPA, 1994b).

The following definitions provide explanations of the USEPA (1994a and 1994b) qualifiers assigned to analytical results during data validation. The data qualifiers described were applied to both inorganic and organic results.

U - The analyte was analyzed for and is not present above the reported sample quantitation limit (SQL).

J - The analyte was analyzed for and was positively identified, but the associated numerical value may not be consistent with the amount actually present in the environmental sample. The data should b considered as a basis for decision-making and are usable for many purposes.

R - The data are rejected as unusable for all purposes. The analyte was analyzed for, but the presence or absence of the analyte was not verified. Resampling and reanalysis are necessary to confirm the presence or absence of the analyte.

UJ - The analyte analyzed for was not present above the reported SQL. The associated numerical value may not accurately or precisely represent the concentration necessary to detect the analyte in the sample.

J1 The analyte is qualified as an estimated value solely because it is greater than the method detection limit (MDL) and less than the SQL indicating no laboratory quality issues.

C2.0 DATA QUALITY

Data quality for each QC parameter where problems were noted during the validation is summarized in this section. Only results that exceeded QA/QC criteria are presented. All frequency requirements for field sample collection of QA/QC samples (field duplicates, MS/MSDs, and blanks) were met. The frequency requirements for laboratory specific method criteria QA/QC were met overall. In Attachment A, Tables A-1 and A-2 present the analytical methods performed for each samples and the samples that were qualified during the validation process, respectively.

C2.1 Surrogate Spikes

Table C2.1 lists all results for target analytes that are out of control with the percentage of out of control results calculated against the total number of samples collected. For methods M8015V the surrogate recoveries were above the upper control limit, indicating a high bias in the sample results. For method SW8015D, the surrogate spikes had low recoveries indicating a low bias in the sample results. As a result, the sample results were qualified as estimated. Out-of-control results are probably related to matrix interference.

Table C2.1
Out-Of-Control Surrogate Spike Impact

Anal. Method	Prep. Method	Matrix	Analyte	Flag	# of Qualified Results	Total Number of Samples	Percent of Results Qualified
M8015D	SW3510	WG	Diesel Range Organics	UJ	1	8	13%
M8015V	SW5030	WG	Gasoline Range Organics	J	1	8	13%

C2.2 Method Blanks

Table C2.2 lists all results for target compounds that are out of control due to method blank contamination with the percentage of out-of-control results calculated against the total number of samples collected. Method M8015V had one contaminated method blank resulting in two sample qualifications. Methane was detected in two method blanks but only resulted in one sample qualification. The blank contamination is probably due to laboratory error.

Table C2.2
Out-Of-Control Method Blank Impact

Anal. Method	Prep. Method	Matrix	Analyte	Flag	# of Qualified Results	Total Number of Samples	Percent of Results Qualified
M2720C	METHOD	WG	Methane	U	1	13	8%
M8015V	SW5030	WG	Gasoline Range Organics	U	2	8	25%

C2.3 Matrix Spikes/Matrix Spike Duplicates

Table C2.3 lists all results for target analytes that are out of control with the percentage of out of control results calculated against the total number of samples collected. MS/MSD validation flags were applied only to the parent sample from a non-compliant MS/MSD. Sample results were not qualified on an analytical batch basis. The spike recoveries (REC) were low for nitrate-nitrite nitrogen, indicating a low bias in the sample results. Out-of-control analytical results are believed to be related to matrix interference and the samples were qualified as estimated. RPD was out of control for methane for two samples. The detected data was qualified as estimated.

Table C2.3
Out-Of-Control Matrix Spike/Matrix Spike Duplicates Impact

Anal. Method	Prep. Method	Matrix	Analyte	Flag	# of Qualified Results	Total Number of Samples	Percent of Results Qualified	QC Parameter
E353.2	METHOD	WG	Nitrate-Nitrite	J	2	8	25%	RPD
M2720C	METHOD	WG	Methane	J	2	13	15%	RPD

C2.4 Laboratory Control Samples

Table C2.4 lists all results for target analytes that are out of control with the percentage of out of control results calculated against the total number of samples collected. The LCS recovery was low for nitrate-nitrite nitrogen causing the data to be qualified as estimated. The out-of-control LCS recovery is most likely due to laboratory error.

Table C2.4
Out-Of-Control Laboratory Control Sample Impact

Anal. Method	Prep. Method	Matrix	Analyte	Flag	# of Qualified Results	Total Number of Samples	Percent of Results Qualified
E353.2	METHOD	WG	Nitrate-Nitrite	J	2	8	25%
E353.2	METHOD	WG	Nitrate-Nitrite	UJ	4	8	50%

C2.5 Field Duplicates

Table C2.5 lists the field duplicate results for compounds where at least one sample in the duplicate pair was detected. The relative percent difference (RPD) was in control for all compounds. The data are not qualified based on field duplicate results.

Table C2.5
Field Duplicates

Location	Matrix	SBD	SED	Anal. Method	Prep. Method	Sample Dup Result	Sample Result	LAB DL	RPD	Range	Units	Analyte
MW013	WG	0	0	E353.2	METHOD	0.03	0.025	0.1		0.005	MG/L	Nitrate-Nitrite
MW013	WG	0	0	M2720C	METHOD	390	380	0.5	3%		UG/L	Methane
MW013	WG	0	0	M2720C	METHOD	2400	2400	50	0%		UG/L	Methane
MW013	WG	0	0	M8015D	SW3510	1.1	1.2	1	9%		MG/L	Diesel Range Organics
MW013	WG	0	0	M8015V	SW5030	11	13	2.5	17%		MG/L	Gasoline Range Organics
MW013	WG	0	0	SW8260	SW5030	400	350	25	13%		UG/L	Benzene
MW013	WG	0	0	SW8260	SW5030	130	120	55	8%		UG/L	Toluene
MW013	WG	0	0	SW8260	SW5030	780	650	30	18%		UG/L	Ethylbenzene
MW013	WG	0	0	SW8260	SW5030	120	99	50	19%		UG/L	Naphthalene
MW013	WG	0	0	SW8260	SW5030	410	340	65	19%		UG/L	1,2,4-Trimethylbenzene
MW013	WG	0	0	SW8260	SW5030	2000	1600	50	22%		UG/L	m-Xylene & p-Xylene
MW013	WG	0	0	SW8260	SW5030	500	420	55	17%		UG/L	o-Xylene

C2.6 Hardcopy Data Review

A review of the hardcopy data for one sample delivery group, revealed some surrogate recovery problems for diesel range organics and BTEX due to matrix interference. No additional analytical problems other than those noted in the preceding paragraphs.

C3.0 CONCLUSIONS

Samples were collected and analyzed as specified in the methods with exception of those issues discussed in this report. All samples are representative of the site and comparable with previous and future investigations (when used in accordance with the validation qualifiers). All sample results qualified as "U, UJ, or J" represent an association to non-compliant QC criteria, which has caused the reported concentration to be estimated. Project objectives do not exclude the use of estimated concentrations. No data was rejected based on the validation. Completeness was 100%. Therefore, all the data are usable for the purposes intended.

C4.0 REFERENCES

U.S. Environmental Protection Agency (USEPA). 1983. Methods for the Chemical Analysis of Water and Wastes. EPA 600/4-79-020. Cincinnati, OH.

USEPA. 1993. Data Quality Objectives Process for Superfund. EPA 540-R-93-071. Washington, DC. September, 1993.

USEPA. 1987-1996. SW-846, Test Methods for Evaluating Solid Waste, Physical and Chemical Methods, Third Edition. Washington, DC.

USEPA. 1994a. Agency National Functional Guidelines for Organic Data Review. PB 94-963502. Washington, DC.

USEPA. 1994b. Agency National Functional Guidelines for Inorganic Data Review. PB 94-963501. Washington, DC.

ATTACHMENT A

VALIDATED SAMPLES AND QUALIFIED ANALYTICAL RESULTS

VALIDATED SAMPLES AND QUALIFIED ANALYTICAL RESULTS

Tables A-1 and A-2 list all qualified Eaker sample data based on the results of data validation. The following definitions of column headers will aide in the understanding and use of these tables.

LOCID: Sample location identifier, unique to each sample when used in conjunction of columns SBD and SED.

MATRIX: Sample matrix identifier. "SO" is soil, "WG" is water.

SACODE: Sample analysis identifier. "N" is for primary field samples, "FR" is for field replicate samples. "N1" or "FR1" designates that the results associate to the original sample analysis. "N8" or "FR8" designates that the results associate to a composite of sample analysis results.

SBD: Sample beginning depth.

SED: Sample ending depth.

COMPOUND NAME: This column identifies the target compound name.

PARVQ: This column designates if a target compound was detected or not. An "=" denotes a detection above the project practical quantitation limit. A "ND" denotes a non-detection above the method detection limit. A "TR" denotes a detection above the method detection limit but below the project practical quantitation limit.

PARVAL: This is the concentration of detection for all detected sample results (TR or =). A zero is a placeholder, which associates to a non-detected compound. The zero does not imply that the compound was not detected at less than zero.

LABDL: This is the concentration at which the laboratory reports the project reporting limit. The project reporting limit is a practical quantitation limit in that it is related to a multiplier of the method detection limit.

ANMCODE: Analytical method code identifier.

EXMCODE: Analytical extraction/preparation method code identifier.

Q: This column represents the final validation qualifier applied to the sample result. It is a composite of all the validation qualifiers for that sample result.

The following column headers apply to the method criteria that are included in a data validation. All of the columns may not appear in Table A-2. Only those method criteria that resulted in qualifying sample results are listed in the table.

HT	Holding Time
MB	Method Blank
TB	Trip Blanks
CB	Calibration Blank
EB	Equipment Blanks
AB	Ambient Blanks
MSR	MS/MSD (%Recovery/Accuracy)
MSP	MS/MSD (%RPD/Precision)
LCR	LCS (%Recovery/Accuracy)
LCP	LCS (%RPD/Precision)
SUR	Surrogate

TABLE A-1
ANALYTICAL METHODS BY SAMPLE LOCATION

LOCID	SBD	SED	MATRIX	D2216	E353.2	M2720C	M8015D	M8015V	SW8021	SW8260	SW9060
MW012	0	0	WG			X				X	
MW013	0	0	WG		X	X	X	X	X	X	
MW014	0	0	WG		X	X	X	X	X	X	
MW015D	0	0	WG		X	X	X	X		X	
MW015I	0	0	WG		X	X	X	X		X	
MW016	0	0	WG		X	X	X	X		X	
MW016	30	32	SO	X							X
MW017	0	0	WG		X	X	X	X		X	
MW018	0	0	WG		X	X	X	X		X	
TW009	0	0	WG						X		
TW010	0	0	WG						X		
TW011	0	0	WG						X		
TW012D	0	0	WG							X	
TW012I	0	0	WG							X	
TW013	0	0	WG							X	
TW014	0	0	WG							X	
TW016D	0	0	WG							X	
TW016I	0	0	WG							X	
TW017	0	0	WG							X	
TW017	42	44	SO	X							X
TW017	48	50	SO	X							X
TW018	0	0	WG							X	
TW019	0	0	WG							X	

TABLE A-2
QUALIFIED ANALYTICAL RESULTS

LOCID	SBD	SED	MATRIX	SACODE	ANMCODE	EXMCODE	COMPD_NAME	PARVQ	PARVAL	LABDL	UTMCODE	Final Q	LCR	MB	MSP	SUR	MSR
MW013	0	0	WG	FD1	E353.2	METHOD	Nitrate-Nitrite	TR	0.03	0.1	MG/L	J	J				J
MW013	0	0	WG	FD1	M2720C	METHOD	Methane	=	390	0.5	UG/L	J			J		
MW013	0	0	WG	N1	E353.2	METHOD	Nitrate-Nitrite	TR	0.025	0.1	MG/L	J	J				J
MW013	0	0	WG	N1	M2720C	METHOD	Methane	=	380	0.5	UG/L	J			J		
MW014	0	0	WG	N1	E353.2	METHOD	Nitrate-Nitrite	ND	0	0.1	MG/L	UJ	UJ				
MW014	0	0	WG	N1	M8015D	SW3510	Diesel Range Organics	ND	0	1	MG/L	UJ				UJ	
MW014	0	0	WG	N1	M8015V	SW5030	Gasoline Range Organics	=	0.13	0.1	MG/L	J				J	
MW016	0	0	WG	N1	E353.2	METHOD	Nitrate-Nitrite	ND	0	0.1	MG/L	UJ	UJ				
MW017	0	0	WG	N1	E353.2	METHOD	Nitrate-Nitrite	ND	0	0.1	MG/L	UJ	UJ				
MW017	0	0	WG	N1	M8015V	SW5030	Gasoline Range Organics	TR	0.014	0.1	MG/L	U		U			
MW018	0	0	WG	N1	E353.2	METHOD	Nitrate-Nitrite	ND	0	0.1	MG/L	UJ	UJ				
MW018	0	0	WG	N1	M2720C	METHOD	Methane	=	1.4	0.5	UG/L	U		U			
MW018	0	0	WG	N1	M8015V	SW5030	Gasoline Range Organics	TR	0.014	0.1	MG/L	U		U			

EXCAVATION SOIL SAMPLING

APPENDIX C
DATA QUALITY ASSESMENT REPORT FOR DATA COLLECTED DURING REMEDIAL EXCAVATION OF AQUITARD SOIL EAKER AIR FORCE BASE

C1.0 INTRODUCTION

A Parsons Engineering Science Level III validation was performed for Eaker Air Force Base (AFB) and consisted of reviewing data deliverables to determine data quality. This included application of data qualifiers to the analytical results based on adherence to method protocols and project-specific quality assurance/quality control (QA/QC) limits. Method protocols reviewed included:

- analytical holding times,
- method blanks (MB),
- trip blanks (TB),
- surrogate spikes,
- matrix spikes/matrix spike duplicates (MS/MSDs),
- laboratory control samples (LCSs), and

Data qualifiers were applied to analytical results during the data validation process. All data were validated using method applicable guidelines and in accordance with the *National Functional Guidelines for Organic Data Review* (USEPA, 1994a) and the *National Functional Guidelines for Inorganic Data Review* (USEPA, 1994b).

The following definitions provide explanations of the USEPA (1994a and 1994b) qualifiers assigned to analytical results during data validation. The data qualifiers described were applied to both inorganic and organic results.

U - The analyte was analyzed for and is not present above the reported sample quantitation limit (SQL).

J - The analyte was analyzed for and was positively identified, but the associated numerical value may not be consistent with the amount actually present in the environmental sample. The data should be considered as a basis for decision-making and are usable for many purposes.

R - The data are rejected as unusable for all purposes. The analyte was analyzed for, but the presence or absence of the analyte was not verified. Resampling and reanalysis are necessary to confirm the presence or absence of the analyte.

UJ - The analyte analyzed for was not present above the reported SQL. The associated numerical value may not accurately or precisely represent the concentration necessary to detect the analyte in the sample.

J1 The analyte is qualified as an estimated value solely because it is greater than the method detection limit (MDL) and less than the SQL indicating no laboratory quality issues.

C2.0 DATA QUALITY

Data quality for each QC parameter where problems were noted during the validation is summarized in this section. Only results that exceeded QA/QC criteria are presented. All frequency requirements for field sample collection of QA/QC samples (field duplicates, MS/MSDs, and blanks) were met. The frequency requirements for laboratory specific method criteria QA/QC were met overall. In Attachment A, Tables A-1 and A-2 present the analytical methods performed for each samples and the samples that were qualified during the validation process, respectively.

C2.1 Surrogate Spikes

Table C2.1 lists all results for target analytes that are out of control with the percentage of out of control results calculated against the total number of samples collected. For method SW8260 the surrogate recoveries were above the upper control limit, indicating a high bias in the sample results. As a result, the sample results were qualified as estimated. Out-of-control results are probably related to matrix interference.

Table C2.1
Out-Of-Control Surrogate Spike Impact

Anal. Method	Prep. Method	Matrix	Analyte	Flag	# of Qualified Results	Total Number of Samples	Percent of Results Qualified
SW8260	SW5030	SO	Benzene	J	1	18	6%
			Ethylbenzene	J	2	18	11%
			Toluene	J	1	18	6%
			Xylenes, Total	J	2	18	11%

C2.2 Method Blanks

Table C2.2 lists all results for target compounds that are out of control due to method blank contamination with the percentage of out-of-control results calculated against the total number of samples collected. Method M8015V had three contaminated method blanks resulting in eight sample qualifications. The blank contamination is probably due to laboratory error.

Table C2.2
Out-Of-Control Method Blank Impact

Anal. Method	Prep. Method	Matrix	Analyte	Flag	# of Qualified Results	Total Number of Samples	Percent of Results Qualified
M8015V	SW5030	SO	Gasoline Range Organics	U	9	18	50%

C3.0 CONCLUSIONS

Samples were collected and analyzed as specified in the methods with exception of those issues discussed in this report. All samples are representative of the site and comparable with previous and future investigations (when used in accordance with the validation qualifiers). All sample results qualified as "U or J" represent an association to non-compliant QC criteria. The data qualified with a "J" has caused the reported concentration to be estimated. Project objectives do not exclude the use of estimated concentrations. No data was rejected based on the validation. Completeness was 100%. Therefore, all the data are usable for the purposes intended.

C4.0 REFERENCES

U.S. Environmental Protection Agency (USEPA). 1983. Methods for the Chemical Analysis of Water and Wastes. EPA 600/4-79-020. Cincinnati, OH.

USEPA. 1993. Data Quality Objectives Process for Superfund. EPA 540-R-93-071. Washington, DC. September, 1993.

USEPA. 1987-1996. SW-846, Test Methods for Evaluating Solid Waste, Physical and Chemical Methods, Third Edition. Washington, DC.

USEPA. 1994a. Agency National Functional Guidelines for Organic Data Review. PB 94-963502. Washington, DC.

USEPA. 1994b. Agency National Functional Guidelines for Inorganic Data Review. PB 94-963501. Washington, DC.

ATTACHMENT A

VALIDATED SAMPLES AND QUALIFIED ANALYTICAL RESULTS

VALIDATED SAMPLES AND QUALIFIED ANALYTICAL RESULTS

Tables A-1 and A-2 list all qualified Eaker sample data based on the results of data validation. The following definitions of column headers will aide in the understanding and use of these tables.

LOCID: Sample location identifier, unique to each sample when used in conjunction of columns SBD and SED.

MATRIX: Sample matrix identifier. "SO" is soil, "WG" is water.

SACODE: Sample analysis identifier. "N" is for primary field samples, "FR" is for field replicate samples. "N1" or "FR1" designates that the results associate to the original sample analysis. "N8" or "FR8" designates that the results associate to a composite of sample analysis results.

SBD: Sample beginning depth.

SED: Sample ending depth.

COMPOUND NAME: This column identifies the target compound name.

PARVQ: This column designates if a target compound was detected or not. An "=" denotes a detection above the project practical quantitation limit. A "ND" denotes a non-detection above the method detection limit. A "TR" denotes a detection above the method detection limit but below the project practical quantitation limit.

PARVAL: This is the concentration of detection for all detected sample results (TR or =). A zero is a placeholder, which associates to a non-detected compound. The zero does not imply that the compound was not detected at less than zero.

LABDL: This is the concentration at which the laboratory reports the project reporting limit. The project reporting limit is a practical quantitation limit in that it is related to a multiplier of the method detection limit.

ANMCODE: Analytical method code identifier.

EXMCODE: Analytical extraction/preparation method code identifier.

Q: This column represents the final validation qualifier applied to the sample result. It is a composite of all the validation qualifiers for that sample result.

The following column headers apply to the method criteria that are included in a data validation. All of the columns may not appear in Table A-2. Only those method criteria that resulted in qualifying sample results are listed in the table.

HT	Holding Time
MB	Method Blank
TB	Trip Blanks
CB	Calibration Blank
EB	Equipment Blanks
AB	Ambient Blanks
MSR	MS/MSD (%Recovery/Accuracy)
MSP	MS/MSD (%RPD/Precision)
LCR	LCS (%Recovery/Accuracy)
LCP	LCS (%RPD/Precision)
SUR	Surrogate

TABLE A-1
ANALYTICAL METHODS BY SAMPLE LOCATION

LOCID	DEPTH (ft)	MATRIX	M8015D	M8015V	SW8260
EX1-001	8.5	SO	X	X	X
EX1-002	8.52	SO	X	X	X
EX1-003	8.5	SO	X	X	X
EX1-004	8.5	SO	X	X	X
EX1-005	8.5	SO	X	X	X
EX1-006	8.5	SO	X	X	X
EX1-007	13	SO	X	X	X
EX1-008	13	SO	X	X	X
EX1-009	13	SO	X	X	X
EX1-010	13	SO	X	X	X
EX1-011	13	SO	X	X	X
EX1-012	Imported Backfill	SO	X	X	X
EX1-013	8.5	SO	X	X	X
EX1-014	8.5	SO	X	X	X
EX1-015	8.5	SO	X	X	X
EX1-016	13	SO	X	X	X
EX1-017	21	SO	X	X	X
EX1-018	21	SO	X	X	X

TABLE A-2
QUALIFIED ANALYTICAL RESULTS

LOCID	DEPTH (ft)	MATRIX	SACODE	ANMCODE	EXMCODE	COMPD_NAME	PARVQ	PARVAL	LABDL	UTMCODE	Final Q	MB	SUR
EX1-002	8.5	SO	N1	SW8015M	SW5030	Gasoline Range Hydrocarbons	=	3.7	1.3	Mg/kg	U	U	
EX1-003	8.5	SO	N1	SW8015M	SW5030	Gasoline Range Hydrocarbons	=	2.9	1.3	Mg/kg	U	U	
EX1-005	8.5	SO	N1	SW8260	SW5030	Xylenes, Total	=	7.6	6.4	Mg/kg	J		J
EX1-006	8.5	SO	N1	SW8260	SW5030	Benzene	=	32.0	6.5	Mg/kg	J		J
EX1-006	8.5	SO	N1	SW8260	SW5030	Ethylbenzene	=	230	6.5	Mg/kg	J		J
EX1-006	8.5	SO	N1	SW8260	SW5030	Toluene	=	13.0	6.5	Mg/kg	J		J
EX1-006	8.5	SO	N1	SW8260	SW5030	Xylenes, Total	=	420	6.5	Mg/kg	J		J
EX1-008	13	SO	N1	SW8015M	SW5030	Gasoline Range Hydrocarbons	=	2.1	1.4	Mg/kg	U	U	
EX1-009	13	SO	N1	SW8015M	SW5030	Gasoline Range Hydrocarbons	=	2.0	1.4	Mg/kg	U	U	
EX1-010	13	SO	N1	SW8015M	SW5030	Gasoline Range Hydrocarbons	=	2.1	1.3	Mg/kg	U	U	
EX1-012	Imported Backfill	SO	N1	SW8015M	SW5030	Gasoline Range Hydrocarbons	=	2.0	1.2	Mg/kg	U	U	
EX1-013	8.5	SO	N1	SW8260	SW5030	Ethylbenzene	=	59.0	6.9	Mg/kg	J		J
EX1-014	8.5	SO	N1	SW8015M	SW5030	Gasoline Range Hydrocarbons	=	1.8	1.4	Mg/kg	U	U	
EX1-016	13	SO	N1	SW8015M	SW5030	Gasoline Range Hydrocarbons	=	2.9	1.4	Mg/kg	U	U	
EX1-017	21	SO	N1	SW8015M	SW5030	Gasoline Range Hydrocarbons	=	6.4	1.4	Mg/kg	U	U	

APPENDIX E

SUPPORTING DOCUMENTATION FOR CALCULATION OF TIER 1 RBSLS AND TIER 2 SSTLS

For more information see the on-line help.

Groundwater Services, Inc.
RBCA Software Documentation

4.0 Additional Troubleshooting Questions

4.1 Why can't I match the Example Tier 1 Lookup Tables in E 1739 or ES 94?

The RBCA Spreadsheet System is fully compatible with the ASTM RBCA Standard. However, in the RBCA software, some default parameters and calculation methods have been updated from the prior versions used in the example calculations presented in Appendix X.2 of ASTM ES 38-94 or ASTM E 1739. Consequently, for some exposure pathways, use of the default settings in the RBCA software will not replicate the example Tier 1 cleanup standard calculations published the ASTM Standards. (Please note that the values listed in Appendix X.2 of these Standards are provided as examples only and do not represent part of the actual ASTM Standards themselves.)

The updated calculation methods included in the RBCA software are itemized below.

- Subsurface Soil Volatilization Algorithm: For the "subsurface soil to closed space" and "subsurface soil to ambient air" pathways, the RBCA Spreadsheet System uses a slightly different algorithm from the example listed in Appendix X.2 of the ASTM RBCA Standards. To provide a more accurate estimate of long-term volatilization rates, a mass-limited volatilization factor (in addition to the rate-limited volatilization factor) has been incorporated in the subsurface volatilization algorithm, similar to that used for the surface soil pathway. This revised algorithm is described in Section A.3, pages A-8 to A-9, of the Tier 2 RBCA Guidance Manual.

If desired, the user can replicate the example calculation of the ASTM Standards by simply setting the input value for "Depth to Base of Affected Soil" on Screen 8.1.1 to a very large value (e.g., 1000 feet). This will cause the RBCA software to default to the same rate-limited volatilization factor used in the example calculations in Appendix X.2 of E 1739. However, the user should note that, for most cases, this prior version of the algorithm results in an extreme over-estimation of actual subsurface volatilization rates and, consequently, provides an overly

conservative estimate of applicable RBSL or SSTL values.

ï Dermal Exposure Factors: In the RBCA software, standard exposure factors for dermal exposure to soils have been updated to match the values published in the most recent U.S. EPA guidance document (i.e., 1992 Dermal Exposure Factors Handbook). Therefore, RBSL values calculated for the "surface soil ingestion/inhalation/dermal contact" pathway will not match the example calculations listed in Appendix X.2 of the ASTM Standards.

To replicate the example RBSL calculations in ASTM ES 38-94 or E 1739, simply match the dermal exposure factor values on Screens 4.1 and 4.2 to the values used in the ASTM example calculations. However, the user shoul note that the exposure factors used in these example calculations are not consistent with current EPA guidelines.

ï Groundwater Volatilization to Enclosed Space Algorithm: For this algorithm, the equation printed in Appendix X.2 of ASTM Standard ES 38-94 contained a typographical error involving an incorrect diffusivity factor. This error is noted in the errata sheets issued in conjunction with the ES 38-94 document. The RBCA software incorporates the corrected algorithm for this pathway. It is not possible to make the software "match" the values in the ES 38-94 document because they were based on an incorrect calculation.

RBCA SITE ASSESSMENT

Site Name: EAKER AFB
Site Location: ARKANSAS

Completed By: Parsons ES, Denver, Co
Date Completed: 7-May-99

Job ID:

GROUNDWATER RBSL VALUES

Target Risk (Class A & B) 1.0E-6
Target Risk (Class C) 1.0E-5
Target Hazard Quotient 1.0E+0

RBSL Results For Complete Exposure Pathways ("X" If Complete)

			Groundwater Ingestion / Discharge to Surface Water			X	GW Vol. to Indoor Air		Groundwater Volatilization to Outdoor Air			Applicable RBSL	RBSL Exceeded ?	Required CRF
CONSTITUENTS OF CONCERN		Representative Concentration	On-site (0 cm)	NA	NA		On-site (0 cm)		On-site (0 cm)	NA	NA			Only if "yes" left
CAS No.	Name	(mg/L)	None	NA	NA		Commercial		None	NA	NA	(mg/L)	"■" if yes	
71-43-2	Benzene		NA	NA	NA		9.8E-2		NA	NA	NA	9.8E-2	☐	NA
108-88-3	Toluene		NA	NA	NA		1.1E+2		NA	NA	NA	1.1E+2	☐	NA
100-41-4	Ethylbenzene		NA	NA	NA		>1.7E+2		NA	NA	NA	>1.7E+2	☐	NA
1330-20-7	Xylene (mixed isomers)		NA	NA	NA		>2.0E+2		NA	NA	NA	>2.0E+2	☐	NA
50-32-8	Benzo(a)Pyrene		NA	NA	NA		>1.6E-3		NA	NA	NA	>1.6E-3	☐	NA
91-20-3	Naphthalene		NA	NA	NA		>3.1E+1		NA	NA	NA	>3.1E+1	☐	NA
1634-04-4	Methyl t-Butyl ether		NA	NA	NA		3.5E+3		NA	NA	NA	3.5E+3	☐	NA

">" indicates risk-based target concentration greater than constituent solubility value. NA = Not applicable. NC = Not calculated.

RBCA SITE ASSESSMENT

Input Parameter Summary

Site Name: EAKER AFB
Site Location: ARKANSAS

Completed By: Parsons ES, Denver, Co
Date Completed: 7-May-99

Job ID:

Exposure Parameters		Residential			Commercial/Industrial	
		Adult	(1-6yrs)	(1-16 yrs)	Chronic	Construc.
AT_c	Averaging time for carcinogens (yr)	70				
AT_n	Averaging time for non-carcinogens (yr)	30			25	1
BW	Body weight (kg)	70	15	35	70	
ED	Exposure duration (yr)	30	6	16	25	1
τ	Averaging time for vapor flux (yr)	30			25	1
EF	Exposure frequency (days/yr)	350			250	180
EF_D	Exposure frequency for dermal exposure	350			250	
IR_w	Ingestion rate of water (L/day)	2			1	
IR_s	Ingestion rate of soil (mg/day)	100	200		50	100
IR_{air-In}	Inhalation rate indoor (m^3/day)	15			20	
$IR_{air-Out}$	Inhalation rate outdoor (m^3/day)	20			20	10
SA	Skin surface area (dermal) (cm^2)	5800		2023	5800	5800
M	Soil to skin adherence factor	1				
ET_{swim}	Swimming exposure time (hr/event)	3				
EV_{swim}	Swimming event frequency (events/yr)	12	12	12		
IR_{swim}	Water ingestion while swimming (L/hr)	0.05	0.5			
SA_{swim}	Skin surface area for swimming (cm^2)	23000		8100		
IR_{fish}	Ingestion rate of fish (kg/yr)	0.025				
FI_{fish}	Contaminated fish fraction (unitless)	1				

Complete Exposure Pathways and Receptors	On-site	Off-site 1	Off-site 2
Groundwater:			
Groundwater Ingestion	None	NA	NA
Soil Leaching to Groundwater Ingestion	None	NA	NA
Applicable Surface Water Exposure Routes:			
Swimming			NA
Fish Consumption			NA
Aquatic Life Protection			NA
Soil:			
Direct Ingestion and Dermal Contact	None		
Outdoor Air:			
Particulates from Surface Soils	None	NA	NA
Volatilization from Soils	None	NA	NA
Volatilization from Groundwater	None	NA	NA
Indoor Air:			
Volatilization from Subsurface Soils	None	NA	NA
Volatilization from Groundwater	Commercial	NA	NA

Receptor Distance from Source Media	On-site	Off-site 1	Off-site 2	(Units)
Groundwater receptor	NA	NA	NA	(cm)
Soil leaching to groundwater receptor	NA	NA	NA	(cm)
Outdoor air inhalation receptor	NA	NA	NA	(cm)

Target Health Risk Values		Individual	Cumulative
TR_{ab}	Target Risk (class A&B carcinogens)	1.0E-6	1.0E-5
TR_c	Target Risk (class C carcinogens)	1.0E-5	
THQ	Target Hazard Quotient (non-carcinogenic risk)	1.0E+0	1.0E+0

Modeling Options	
RBCA tier	Tier 1
RBCA calculation mode	Backward Only
Risk goal calculation option	Individual & Cumulative Constituent Risks
Soil volatilization model option	NA
Use soil attenuation model (SAM) for leachate?	NA
Air dilution factor	NA
Groundwater dilution-attenuation factor	NA

NOTE: NA = Not applicable

Surface Parameters		General	Construction	(Units)
A	Source zone area	NA	NA	(cm^2)
W	Length of source-zone area parallel to wind	NA	NA	(cm)
W_{gw}	Length of source-zone area parallel to GW flow	NA		(cm)
U_{air}	Ambient air velocity in mixing zone	NA		(cm/s)
δ_{air}	Air mixing zone height	NA		(cm)
P_a	Areal particulate emission rate	NA		(g/cm^2/s)
L_{ss}	Thickness of affected surface soils	NA		(cm)

Surface Soil Column Parameters		Value			(Units)
h_{cap}	Capillary zone thickness	9.0E+0			(cm)
h_v	Vadose zone thickness	2.0E+2			(cm)
ρ_s	Soil bulk density	1.7E+0			(g/cm^3)
f_{oc}	Fraction organic carbon	1.4E-3			(-)
θ_T	Soil total porosity	4.1E-1			(-)
K_{vs}	Vertical hydraulic conductivity	8.6E+1			(cm/d)
k_v	Vapor permeability	1.0E-9			(cm^2)
L_{gw}	Depth to groundwater	2.1E+2			(cm)
L_s	Depth to top of affected soils	NA			(cm)
L_{base}	Depth to base of affected soils	NA			(cm)
L_{subs}	Thickness of affected soils	NA			(cm)
pH	Soil/groundwater pH	6.5E+0			(-)
		capillary	vadose	foundation	
θ_w	Volumetric water content	0.369	0.12	0.12	(-)
θ_a	Volumetric air content	0.041	0.29	0.26	(-)

Building Parameters		Residential	Commercial	(Units)
L_b	Building volume/area ratio	NA	3.00E+2	(cm)
A_b	Foundation area	NA	7.00E+5	(cm^2)
X_{crk}	Foundation perimeter	NA	3.40E+3	(cm)
ER	Building air exchange rate	NA	2.30E-4	(1/s)
L_{crk}	Foundation thickness	NA	1.50E+1	(cm)
Z_{crk}	Depth to bottom of foundation slab	NA	1.50E+1	(cm)
η	Foundation crack fraction	NA	1.00E-2	(-)
dP	Indoor/outdoor differential pressure	NA	0.00E+0	(g/cm/s^2)
Q_s	Convective air flow through slab	NA	0.00E+0	(cm^3/s)

Groundwater Parameters		Value	(Units)
δ_{gw}	Groundwater mixing zone depth	NA	(cm)
I_f	Net groundwater infiltration rate	NA	(in/yr)
U_{gw}	Groundwater Darcy velocity	NA	(cm/d)
V_{gw}	Groundwater seepage velocity	NA	(cm/d)
K_s	Saturated hydraulic conductivity	NA	(cm/d)
i	Groundwater gradient	NA	(-)
S_w	Width of groundwater source zone	NA	(cm)
S_d	Depth of groundwater source zone	NA	(cm)
θ_{eff}	Effective porosity in water-bearing unit	NA	(-)
f_{oc-sat}	Fraction organic carbon in water-bearing unit	NA	(-)
pH_{sat}	Groundwater pH	NA	(-)
	Biodegradation considered?	NA	

Transport Parameters		Off-site 1	Off-site 2	Off-site 1	Off-site 2	(Units)
Lateral Groundwater Transport		Groundwater Ingestion		Soil Leaching to GW		
α_x	Longitudinal dispersivity	NA	NA	NA	NA	(cm)
α_y	Transverse dispersivity	NA	NA	NA	NA	(cm)
α_z	Vertical dispersivity	NA	NA	NA	NA	(cm)
Lateral Outdoor Air Transport		Soil to Outdoor Air Inhal.		GW to Outdoor Air Inhal.		
σ_y	Transverse dispersion coefficient	NA	NA	NA	NA	(cm)
σ_z	Vertical dispersion coefficient	NA	NA	NA	NA	(cm)
ADF	Air dispersion factor	NA	NA	NA	NA	(-)

Surface Water Parameters		Off-site 2	(Units)
Q_{sw}	Surface water flowrate	NA	(cm^3/s)
W_{pl}	Width of GW plume at SW discharge	NA	(cm)
δ_{pl}	Thickness of GW plume at SW discharge	NA	(cm)
DF_{sw}	Groundwater-to-surface water dilution factor	NA	(-)

RBCA SITE ASSESSM...T

Input Parameter Summary

Site Name: EAKER AFB
Site Location: ARKANSAS

Completed By: Parsons ES, Denver, Co
Date Completed: 7-May-99

Job ID:

Exposure Parameters		Residential			Commercial/Industrial	
		Adult	(1-6yrs)	(1-16 yrs)	Chronic	Construc.
AT_c	Averaging time for carcinogens (yr)	70				
AT_n	Averaging time for non-carcinogens (yr)	30			25	1
BW	Body weight (kg)	70	15	35	70	
ED	Exposure duration (yr)	30	6	16	25	1
τ	Averaging time for vapor flux (yr)	30			25	1
EF	Exposure frequency (days/yr)	350			250	180
EF_D	Exposure frequency for dermal exposure	350			250	
IR_w	Ingestion rate of water (L/day)	2			1	
IR_s	Ingestion rate of soil (mg/day)	100	200		50	100
IR_{air-in}	Inhalation rate indoor (m^3/day)	15			20	
$IR_{air-Out}$	Inhalation rate outdoor (m^3/day)	20			20	10
SA	Skin surface area (dermal) (cm^2)	5800		2023	5800	5800
M	Soil to skin adherence factor	1				
ET_{swim}	Swimming exposure time (hr/event)	3				
EV_{swim}	Swimming event frequency (events/yr)	12	12	12		
IR_{swim}	Water ingestion while swimming (L/hr)	0.05	0.5			
SA_{swim}	Skin surface area for swimming (cm^2)	23000		8100		
IR_{fish}	Ingestion rate of fish (kg/yr)	0.025				
FI_{fish}	Contaminated fish fraction (unitless)	1				

Complete Exposure Pathways and Receptors	On-site	Off-site 1	Off-site 2
Groundwater:			
Groundwater Ingestion	None	NA	NA
Soil Leaching to Groundwater Ingestion	None	NA	NA
Applicable Surface Water Exposure Routes:			
Swimming			NA
Fish Consumption			NA
Aquatic Life Protection			NA
Soil:			
Direct Ingestion and Dermal Contact	None		
Outdoor Air:			
Particulates from Surface Soils	None	NA	NA
Volatilization from Soils	None	NA	NA
Volatilization from Groundwater	None	NA	NA
Indoor Air:			
Volatilization from Subsurface Soils	None	NA	NA
Volatilization from Groundwater	Commercial	NA	NA

Receptor Distance from Source Media	On-site	Off-site 1	Off-site 2	(Units)
Groundwater receptor	NA	NA	NA	(cm)
Soil leaching to groundwater receptor	NA	NA	NA	(cm)
Outdoor air inhalation receptor	NA	NA	NA	(cm)

Target Health Risk Values		Individual	Cumulative
TR_{ab}	Target Risk (class A&B carcinogens)	1.0E-6	1.0E-5
TR_c	Target Risk (class C carcinogens)	1.0E-5	
THQ	Target Hazard Quotient (non-carcinogenic risk)	1.0E+0	1.0E+0

Modeling Options	
RBCA tier	Tier 1
RBCA calculation mode	Backward Only
Risk goal calculation option	Individual & Cumulative Constituent Risks
Soil volatilization model option	NA
Use soil attenuation model (SAM) for leachate?	NA
Air dilution factor	NA
Groundwater dilution-attenuation factor	NA

NOTE: NA = Not applicable

Surface Parameters		General	Construction	(Units)
A	Source zone area	NA	NA	(cm^2)
W	Length of source-zone area parallel to wind	NA	NA	(cm)
W_{gw}	Length of source-zone area parallel to GW flow	NA		(cm)
U_{air}	Ambient air velocity in mixing zone	NA		(cm/s)
δ_{air}	Air mixing zone height	NA		(cm)
P_a	Areal particulate emission rate	NA		(g/cm^2/s)
L_{ss}	Thickness of affected surface soils	NA		(cm)

Surface Soil Column Parameters		Value			(Units)
h_{cap}	Capillary zone thickness	9.0E+0			(cm)
h_v	Vadose zone thickness	2.0E+2			(cm)
ρ_s	Soil bulk density	1.7E+0			(g/cm^3)
f_{oc}	Fraction organic carbon	1.4E-3			(-)
θ_T	Soil total porosity	4.1E-1			(-)
K_{vs}	Vertical hydraulic conductivity	8.6E+1			(cm/d)
k_v	Vapor permeability	1.0E-9			(cm^2)
L_{gw}	Depth to groundwater	2.1E+2			(cm)
L_s	Depth to top of affected soils	NA			(cm)
L_{base}	Depth to base of affected soils	NA			(cm)
L_{subs}	Thickness of affected soils	NA			(cm)
pH	Soil/groundwater pH	6.5E+0			(-)
		capillary	vadose	foundation	
θ_w	Volumetric water content	0.369	0.12	0.12	(-)
θ_a	Volumetric air content	0.041	0.29	0.26	(-)

Building Parameters		Residential	Commercial	(Units)
L_b	Building volume/area ratio	NA	3.00E+2	(cm)
A_b	Foundation area	NA	7.00E+5	(cm^2)
X_{crk}	Foundation perimeter	NA	3.40E+3	(cm)
ER	Building air exchange rate	NA	2.30E-4	(1/s)
L_{crk}	Foundation thickness	NA	1.50E+1	(cm)
Z_{crk}	Depth to bottom of foundation slab	NA	1.50E+1	(cm)
η	Foundation crack fraction	NA	1.00E-2	(-)
dP	Indoor/outdoor differential pressure	NA	0.00E+0	(g/cm/s^2)
Q_s	Convective air flow through slab	NA	0.00E+0	(cm^3/s)

Groundwater Parameters		Value	(Units)
δ_{gw}	Groundwater mixing zone depth	NA	(cm)
I_f	Net groundwater infiltration rate	NA	(in/yr)
U_{gw}	Groundwater Darcy velocity	NA	(cm/d)
V_{gw}	Groundwater seepage velocity	NA	(cm/d)
K_s	Saturated hydraulic conductivity	NA	(cm/d)
i	Groundwater gradient	NA	(-)
S_w	Width of groundwater source zone	NA	(cm)
S_d	Depth of groundwater source zone	NA	(cm)
θ_{eff}	Effective porosity in water-bearing unit	NA	(-)
f_{oc-sat}	Fraction organic carbon in water-bearing unit	NA	(-)
pH_{sat}	Groundwater pH	NA	(-)
	Biodegradation considered?	NA	

Transport Parameters		Off-site 1	Off-site 2	Off-site 1	Off-site 2	(Units)
Lateral Groundwater Transport		Groundwater Ingestion		Soil Leaching to GW		
α_x	Longitudinal dispersivity	NA	NA	NA	NA	(cm)
α_y	Transverse dispersivity	NA	NA	NA	NA	(cm)
α_z	Vertical dispersivity	NA	NA	NA	NA	(cm)
Lateral Outdoor Air Transport		Soil to Outdoor Air Inhal.		GW to Outdoor Air Inhal.		
σ_y	Transverse dispersion coefficient	NA	NA	NA	NA	(cm)
σ_z	Vertical dispersion coefficient	NA	NA	NA	NA	(cm)
ADF	Air dispersion factor	NA	NA	NA	NA	(-)

Surface Water Parameters		Off-site 2	(Units)
Q_{sw}	Surface water flowrate	NA	(cm^3/s)
W_{pl}	Width of GW plume at SW discharge	NA	(cm)
δ_{pl}	Thickness of GW plume at SW discharge	NA	(cm)
DF_{sw}	Groundwater-to-surface water dilution factor	NA	(-)

CHEMICAL DATA FOR SELECTED COCs

Physical Property Data

Constituent	CAS Number	type	Molecular Weight (g/mole) MW	ref	Diffusion Coefficients in air (cm2/s) Dair	ref	in water (cm2/s) Dwat	ref	log (Koc) or log(Kd) (@ 20 - 25 C) log(L/kg) partition	ref	Henry's Law Constant (@ 20 - 25 C) (atm-m3) mol	(unitless)	ref	Vapor Pressure (@ 20 - 25 C) (mm Hg)	ref	Solubility (@ 20 - 25 C) (mg/L)	ref	acid pKa	base pKb	ref
Benzene	71-43-2	A	78.1	PS	8.80E-02	PS	9.80E-06	PS	1.77 Koc	PS	5.55E-03	2.29E-01	PS	9.52E+01	PS	1.75E+03	PS	-	-	-
Toluene	108-88-3	A	92.4	5	8.50E-02	A	9.40E-06	A	2.13 Koc	A	6.30E-03	2.60E-01	A	3.00E+01	4	5.15E+02	29	-	-	-
Ethylbenzene	100-41-4	A	106.2	PS	7.50E-02	PS	7.80E-06	PS	2.56 Koc	PS	7.88E-03	3.25E-01	PS	1.00E+01	PS	1.69E+02	PS	-	-	-
Xylene (mixed isomers)	1330-20-7	A	106.2	5	7.20E-02	A	8.50E-06	A	2.38 Koc	A	7.03E-03	2.90E-01	A	7.00E+00	4	1.98E+02	5	-	-	-
Benzo(a)Pyrene	50-32-8	PAH	252.3	PS	4.30E-02	PS	9.00E-06	PS	6.01 Koc	PS	1.13E-06	4.66E-05	PS	5.68E-04	PS	1.62E-03	PS	-	-	-
Naphthalene	91-20-3	PAH	128.2	PS	5.90E-02	PS	7.50E-06	PS	3.30 Koc	PS	4.83E-04	1.99E-02	PS	2.30E-01	PS	3.10E+01	PS	-	-	-
Methyl t-Butyl ether	1634-04-4	O	88.146	5	7.92E-02	6	9.41E-05	7	1.08 Koc	A	5.77E-04	2.38E-02	0	2.49E+02	0	4.80E+04	A	-	-	-

Site Name: EAKER AFB
Site Location: ARKANSAS

Completed By: Parsons ES, Denver, Co
Date Completed: 7-May-99

Job ID:

CHEMICAL DATA FOR SELECTED COCs

Toxicity Data

Constituent	Reference Dose (mg/kg/day) Oral RfD_oral	ref	Reference Dose (mg/kg/day) Dermal RfD_dermal	ref	Reference Conc. (mg/m3) Inhalation RfC_inhal	ref	Slope Factors 1/(mg/kg/day) Oral SF_oral	ref	Slope Factors 1/(mg/kg/day) Dermal SF_dermal	ref	Unit Risk Factor 1/(µg/m3) Inhalation URF_inhal	ref	EPA Weight of Evidence	Is Constituent Carcinogenic ?
Benzene	3.00E-03	R	-	-	5.95E-03	R	2.90E-02	PS	2.99E-02	TX	8.29E-06	PS	A	TRUE
Toluene	2.00E-01	A,R	1.60E-01	TX	4.00E-01	A,R	-	-	-	-	-	-	D	FALSE
Ethylbenzene	1.00E-01	PS	9.70E-02	TX	1.00E+00	PS	-	-	-	-	-	-	D	FALSE
Xylene (mixed isomers)	2.00E+00	A,R	1.84E+00	TX	7.00E+00	A	-	-	-	-	-	-	D	FALSE
Benzo(a)Pyrene	-	-	-	-	1.10E+01	31	7.30E+00	PS	8.20E+00	TX	2.09E-03	PS	B2	TRUE
Naphthalene	4.00E-01	PS	3.56E-01	TX	1.40E+00	PS	-	-	-	-	-	0	D	FALSE
Methyl t-Butyl ether	1.00E-02	31	8.00E-03	TX	3.00E+00	R	-	-	-	-	-	-	-	FALSE

Site Name: EAKER AFB

Site Location: ARKANSAS

Miscellaneous Chemical Data

Constituent	Maximum Contaminant Level MCL (mg/L)	ref	Time-Weighted Average Workplace Criteria TWA (mg/m3)	ref	Aquatic Life Prot. Criteria AQL (mg/L)	ref	Biocon-centration Factor (L-wat/kg-fish)
Benzene	5.00E-03	52 FR 25690	3.25E+00	PS	-	-	12.6
Toluene	1.00E+00	56 FR 3526 (30 Jan 91)	1.47E+02	ACGIH	-	-	70
Ethylbenzene	7.00E-01	56 FR 3526 (30 Jan 91)	4.35E+02	PS	-	-	1
Xylene (mixed isomers)	1.00E+01	56 FR 3526 (30 Jan 91)	4.34E+02	ACGIH	-	-	1
Benzo(a)Pyrene	2.00E-04	57 31776 (17 Jul 92)	2.00E-01	PS	-	-	1
Naphthalene	-	-	5.00E+01	PS	-	-	430
Methyl t-Butyl ether	-	-	6.00E+01	NIOSH	-	-	1

Site Name: EAKER AFB

Site Location: ARKANSAS

CHEMICAL DATA FOR SELECTED COCs

Miscellaneous Chemical Data

Constituent	Dermal Relative Absorp. Factor (unitless)	Water Dermal Permeability Data: Dermal Permeability Coeff. (cm/hr)	Lag time for Dermal Exposure (hr)	Critical Exposure Time (hr)	Relative Contr of Derm Perm Coeff (unitless)	Water/Skin Derm Adsorp Factor (cm/event)	ref	Detection Limits: Groundwater (mg/L)	ref	Soil (mg/kg)	ref	Half Life (First-Order Decay) (days): Saturated	Unsaturated	ref
Benzene	0.5	0.021	0.26	0.63	0.013	7.3E-2	D	0.002	C	0.005	S	720	720	H
Toluene	0.5	0.045	0.32	0.77	0.054	1.6E-1	D	0.002	C	0.005	S	28	28	H
Ethylbenzene	0.5	0.074	0.39	1.3	0.14	2.7E-1	D	0.002	C	0.005	S	228	228	H
Xylene (mixed isomers)	0.5	0.08	0.39	1.4	0.16	2.9E-1	D	0.005	C	0.005	S	360	360	H
Benzo(a)Pyrene	0.05	-	-	-	-	-	-	0.01	32	0.66	32	1060	1060	H
Naphthalene	0.05	0.069	0.53	2.2	0.2	2.7E-1	D	0.01	32	0.01	32	258	258	H
Methyl t-Butyl ether	0.5	-	-	-	-	-	-	-	-	-	-	360	180	H

Site Name: EAKER AFB

Site Location: ARKANSAS

RBCA SITE ASSESSMENT

Site Name: EAKER AFB
Site Location: ARKANSAS

Completed By: Parsons ES, Denver, Co
Date Completed: 27-May-99

Job ID:

GROUNDWATER RBSL VALUES

Target Risk (Class A & B) 1.0E-6
Target Risk (Class C) 1.0E-5
Target Hazard Quotient 1.0E+0

RBSL Results For Complete Exposure Pathways ("X" if Complete)

CONSTITUENTS OF CONCERN		Representative Concentration	Groundwater Ingestion / Discharge to Surface Water			GW Vol. to Indoor Air	X	Groundwater Volatilization to Outdoor Air			Applicable RBSL	RBSL Exceeded ?	Required CRF
			On-site (0 cm)	NA	NA	On-site (0 cm)		On-site (0 cm)	NA	NA			Only if "yes" left
CAS No.	Name	(mg/L)	None	NA	NA	None		Commercial	NA	NA	(mg/L)	"■" if yes	
71-43-2	Benzene		NA	NA	NA	NA		1.7E+3	NA	NA	1.7E+3	☐	NA
108-88-3	Toluene		NA	NA	NA	NA		>5.2E+2	NA	NA	>5.2E+2	☐	NA
100-41-4	Ethylbenzene		NA	NA	NA	NA		>1.7E+2	NA	NA	>1.7E+2	☐	NA
1330-20-7	Xylene (mixed isomers)		NA	NA	NA	NA		>2.0E+2	NA	NA	>2.0E+2	☐	NA
50-32-8	Benzo(a)Pyrene		NA	NA	NA	NA		>1.6E-3	NA	NA	>1.6E-3	☐	NA
91-20-3	Naphthalene		NA	NA	NA	NA		>3.1E+1	NA	NA	>3.1E+1	☐	NA
1634-04-4	Methyl t-Butyl ether		NA	NA	NA	NA		>4.8E+4	NA	NA	>4.8E+4	☐	NA

">" indicates risk-based target concentration greater than constituent solubility value. NA = Not applicable. NC = Not calculated.

RBCA SITE ASSESSMENT

Input Parameter Summary

Site Name: EAKER AFB
Site Location: ARKANSAS

Completed By: Parsons ES, Denver, Co
Date Completed: 27-May-99

Job ID:

Exposure Parameters		Residential			Commercial/Industrial	
		Adult	(1-6yrs)	(1-16 yrs)	Chronic	Construc.
AT_c	Averaging time for carcinogens (yr)	70				
AT_n	Averaging time for non-carcinogens (yr)	30			1	1
BW	Body weight (kg)	70	15	35	70	
ED	Exposure duration (yr)	30	6	16	1	1
τ	Averaging time for vapor flux (yr)	30			1	1
EF	Exposure frequency (days/yr)	350			180	180
EF_D	Exposure frequency for dermal exposure	350			250	
IR_w	Ingestion rate of water (L/day)	2			1	
IR_s	Ingestion rate of soil (mg/day)	100	200		100	100
IR_{air-In}	Inhalation rate indoor (m^3/day)	15			20	
$IR_{air-Out}$	Inhalation rate outdoor (m^3/day)	20			10	10
SA	Skin surface area (dermal) (cm^2)	5800		2023	5800	5800
M	Soil to skin adherence factor	1				
ET_{swim}	Swimming exposure time (hr/event)	3				
EV_{swim}	Swimming event frequency (events/yr)	12	12	12		
IR_{swim}	Water ingestion while swimming (L/hr)	0.05	0.5			
SA_{swim}	Skin surface area for swimming (cm^2)	23000		8100		
IR_{fish}	Ingestion rate of fish (kg/yr)	0.025				
FI_{fish}	Contaminated fish fraction (unitless)	1				

Complete Exposure Pathways and Receptors	On-site	Off-site 1	Off-site 2
Groundwater:			
Groundwater Ingestion	None	NA	NA
Soil Leaching to Groundwater Ingestion	None	NA	NA
Applicable Surface Water Exposure Routes:			
Swimming			NA
Fish Consumption			NA
Aquatic Life Protection			NA
Soil:			
Direct Ingestion and Dermal Contact	None		
Outdoor Air:			
Particulates from Surface Soils	None	NA	NA
Volatilization from Soils	None	NA	NA
Volatilization from Groundwater	Commercial	NA	NA
Indoor Air:			
Volatilization from Subsurface Soils	None	NA	NA
Volatilization from Groundwater	None	NA	NA

Receptor Distance from Source Media	On-site	Off-site 1	Off-site 2	(Units)
Groundwater receptor	NA	NA	NA	(cm)
Soil leaching to groundwater receptor	NA	NA	NA	(cm)
Outdoor air inhalation receptor	0	NA	NA	(cm)

Target Health Risk Values		Individual	Cumulative
TR_{ca}	Target Risk (class A&B carcinogens)	1.0E-6	1.0E-5
TR_c	Target Risk (class C carcinogens)	1.0E-5	
THQ	Target Hazard Quotient (non-carcinogenic risk)	1.0E+0	1.0E+0

Modeling Options	
RBCA tier	Tier 1
RBCA calculation mode	Backward Only
Risk goal calculation option	Individual & Cumulative Constituent Risks
Soil volatilization model option	NA
Use soil attenuation model (SAM) for leachate?	NA
Air dilution factor	NA
Groundwater dilution-attenuation factor	NA

NOTE: NA = Not applicable

Surface Parameters		General	Construction	(Units)
A	Source zone area	2.0E+7	NA	(cm^2)
W	Length of source-zone area parallel to wind	4.5E+3	NA	(cm)
W_{gw}	Length of source-zone area parallel to GW flow	NA		(cm)
U_{air}	Ambient air velocity in mixing zone	2.3E+2		(cm/s)
δ_{air}	Air mixing zone height	2.0E+2		(cm)
P_a	Areal particulate emission rate	NA		(g/cm^2/s)
L_{ss}	Thickness of affected surface soils	NA		(cm)

Surface Soil Column Parameters		Value			(Units)
h_{cap}	Capillary zone thickness	9.0E+0			(cm)
h_v	Vadose zone thickness	2.0E+2			(cm)
ρ_s	Soil bulk density	1.7E+0			(g/cm^3)
f_{oc}	Fraction organic carbon	1.4E-3			(-)
θ_T	Soil total porosity	4.1E-1			(-)
K_{vs}	Vertical hydraulic conductivity	8.6E+1			(cm/d)
k_v	Vapor permeability	1.0E-9			(cm^2)
L_{gw}	Depth to groundwater	2.1E+2			(cm)
L_s	Depth to top of affected soils	NA			(cm)
L_{base}	Depth to base of affected soils	NA			(cm)
L_{subs}	Thickness of affected soils	NA			(cm)
pH	Soil/groundwater pH	6.5E+0			(-)
		capillary	vadose	foundation	
θ_w	Volumetric water content	0.369	0.12	0.12	(-)
θ_a	Volumetric air content	0.041	0.29	0.26	(-)

Building Parameters		Residential	Commercial	(Units)
L_b	Building volume/area ratio	NA	NA	(cm)
A_b	Foundation area	NA	NA	(cm^2)
X_{crk}	Foundation perimeter	NA	NA	(cm)
ER	Building air exchange rate	NA	NA	(1/s)
L_{crk}	Foundation thickness	NA	NA	(cm)
Z_{crk}	Depth to bottom of foundation slab	NA	NA	(cm)
η	Foundation crack fraction	NA	NA	(-)
dP	Indoor/outdoor differential pressure	NA	NA	(g/cm/s^2)
Q_s	Convective air flow through slab	NA	NA	(cm^3/s)

Groundwater Parameters		Value	(Units)
δ_{gw}	Groundwater mixing zone depth	NA	(cm)
I_f	Net groundwater infiltration rate	NA	(in/yr)
U_{gw}	Groundwater Darcy velocity	NA	(cm/d)
V_{gw}	Groundwater seepage velocity	NA	(cm/d)
K_s	Saturated hydraulic conductivity	NA	(cm/d)
i	Groundwater gradient	NA	(-)
S_w	Width of groundwater source zone	NA	(cm)
S_d	Depth of groundwater source zone	NA	(cm)
θ_{eff}	Effective porosity in water-bearing unit	NA	(-)
f_{oc-sat}	Fraction organic carbon in water-bearing unit	NA	(-)
pH_{sat}	Groundwater pH	NA	(-)
	Biodegradation considered?	NA	

Transport Parameters		Off-site 1	Off-site 2	Off-site 1	Off-site 2	(Units)
Lateral Groundwater Transport		Groundwater Ingestion		Soil Leaching to GW		
α_x	Longitudinal dispersivity	NA	NA	NA	NA	(cm)
α_y	Transverse dispersivity	NA	NA	NA	NA	(cm)
α_z	Vertical dispersivity	NA	NA	NA	NA	(cm)
Lateral Outdoor Air Transport		Soil to Outdoor Air Inhal.		GW to Outdoor Air Inhal.		
σ_y	Transverse dispersion coefficient	NA	NA	NA	NA	(cm)
σ_z	Vertical dispersion coefficient	NA	NA	NA	NA	(cm)
ADF	Air dispersion factor	NA	NA	NA	NA	(-)

Surface Water Parameters		Off-site 2	(Units)
Q_{sw}	Surface water flowrate	NA	(cm^3/s)
W_{pl}	Width of GW plume at SW discharge	NA	(cm)
δ_{pl}	Thickness of GW plume at SW discharge	NA	(cm)
DF_{sw}	Groundwater-to-surface water dilution factor	NA	(-)

RBCA SITE ASSESSMENT

Site Name: EAKER AFB
Site Location: ARKANSAS

Completed By: Parsons ES, Denver, Co
Date Completed: 7-May-99

Job ID:

SSTL GROUNDWATER ~~RBSL~~ VALUES

Target Risk (Class A & B) 1.0E-6
Target Risk (Class C) 1.0E-5
Target Hazard Quotient 1.0E+0

Construction

RBSL Results For Complete Exposure Pathways ("X" if Complete)

CONSTITUENTS OF CONCERN		Representative Concentration	Groundwater Ingestion / Discharge to Surface Water			GW Vol. to Indoor Air	X Groundwater Volatilization to Outdoor Air			Applicable RBSL	RBSL Exceeded ?	Required CRF
			On-site (0 cm)	NA	NA	On-site (0 cm)	On-site (0 cm)	NA	NA			Only if "yes" left
CAS No.	Name	(mg/L)	None	NA	NA	None	~~Commercial~~	NA	NA	(mg/L)	"■" if yes	
71-43-2	Benzene		NA	NA	NA	NA	>1.8E+3	NA	NA	>1.8E+3	☐	NA
108-88-3	Toluene		NA	NA	NA	NA	>5.2E+2	NA	NA	>5.2E+2	☐	NA
100-41-4	Ethylbenzene		NA	NA	NA	NA	>1.7E+2	NA	NA	>1.7E+2	☐	NA
1330-20-7	Xylene (mixed isomers)		NA	NA	NA	NA	>2.0E+2	NA	NA	>2.0E+2	☐	NA
50-32-8	Benzo(a)Pyrene		NA	NA	NA	NA	>1.6E-3	NA	NA	>1.6E-3	☐	NA
91-20-3	Naphthalene		NA	NA	NA	NA	>3.1E+1	NA	NA	>3.1E+1	☐	NA
1634-04-4	Methyl t-Butyl ether		NA	NA	NA	NA	>4.8E+4	NA	NA	>4.8E+4	☐	NA

">" indicates risk-based target concentration greater than constituent solubility value. NA = Not applicable. NC = Not calculated.

RBCA SITE ASSESSMENT

Input Parameter Summary

Site Name: EAKER AFB
Site Location: ARKANSAS

Completed By: Parsons ES, Denver, Co
Date Completed: 7-May-99

Job ID:

Exposure Parameters		Residential			Commercial/Industrial	
		Adult	(1-6yrs)	(1-16 yrs)	Chronic	Construc.
AT_c	Averaging time for carcinogens (yr)	70				
AT_n	Averaging time for non-carcinogens (yr)	30			1	1
BW	Body weight (kg)	70	15	35	70	
ED	Exposure duration (yr)	30	6	16	1	1
τ	Averaging time for vapor flux (yr)	30			1	1
EF	Exposure frequency (days/yr)	350			64	180
EF_D	Exposure frequency for dermal exposure	350			64	
IR_w	Ingestion rate of water (L/day)	2			1	
IR_s	Ingestion rate of soil (mg/day)	100	200		100	100
IR_{air-In}	Inhalation rate indoor (m^3/day)	15			20	
$IR_{air-Out}$	Inhalation rate outdoor (m^3/day)	20			10	10
SA	Skin surface area (dermal) (cm^2)	5800		2023	5800	5800
M	Soil to skin adherence factor	1				
ET_{swim}	Swimming exposure time (hr/event)	3				
EV_{swim}	Swimming event frequency (events/yr)	12	12	12		
IR_{swim}	Water ingestion while swimming (L/hr)	0.05	0.5			
SA_{swim}	Skin surface area for swimming (cm^2)	23000		8100		
IR_{fish}	Ingestion rate of fish (kg/yr)	0.025				
FI_{fish}	Contaminated fish fraction (unitless)	1				

Complete Exposure Pathways and Receptors	On-site	Off-site 1	Off-site 2
Groundwater:			
Groundwater Ingestion	None	NA	NA
Soil Leaching to Groundwater Ingestion	None	NA	NA
Applicable Surface Water Exposure Routes:			
Swimming			NA
Fish Consumption			NA
Aquatic Life Protection			NA
Soil:			
Direct Ingestion and Dermal Contact	None		
Outdoor Air:			
Particulates from Surface Soils	None	NA	NA
Volatilization from Soils	None	NA	NA
Volatilization from Groundwater	Commercial	NA	NA
Indoor Air:			
Volatilization from Subsurface Soils	None	NA	NA
Volatilization from Groundwater	None	NA	NA

Receptor Distance from Source Media	On-site	Off-site 1	Off-site 2	(Units)
Groundwater receptor	NA	NA	NA	(cm)
Soil leaching to groundwater receptor	NA	NA	NA	(cm)
Outdoor air inhalation receptor	0	NA	NA	(cm)

Target Health Risk Values		Individual	Cumulative
TR_{ab}	Target Risk (class A&B carcinogens)	1.0E-6	1.0E-5
TR_c	Target Risk (class C carcinogens)	1.0E-5	
THQ	Target Hazard Quotient (non-carcinogenic risk)	1.0E+0	1.0E+0

Modeling Options	
RBCA tier	Tier 1
RBCA calculation mode	Backward Only
Risk goal calculation option	Individual & Cumulative Constituent Risks
Soil volatilization model option	NA
Use soil attenuation model (SAM) for leachate?	NA
Air dilution factor	NA
Groundwater dilution-attenuation factor	NA

NOTE: NA = Not applicable

Surface Parameters		General	Construction	(Units)
A	Source zone area	2.0E+7	NA	(cm^2)
W	Length of source-zone area parallel to wind	4.5E+3	NA	(cm)
W_{gw}	Length of source-zone area parallel to GW flow	NA		(cm)
U_{air}	Ambient air velocity in mixing zone	2.3E+2		(cm/s)
δ_{air}	Air mixing zone height	2.0E+2		(cm)
P_a	Areal particulate emission rate	NA		(g/cm^2/s)
L_{ss}	Thickness of affected surface soils	NA		(cm)

Surface Soil Column Parameters		Value			(Units)
h_{cap}	Capillary zone thickness	9.0E+0			(cm)
h_v	Vadose zone thickness	2.0E+2			(cm)
ρ_s	Soil bulk density	1.7E+0			(g/cm^3)
f_{oc}	Fraction organic carbon	1.4E-3			(-)
θ_T	Soil total porosity	4.1E-1			(-)
K_{vs}	Vertical hydraulic conductivity	8.6E+1			(cm/d)
k_v	Vapor permeability	1.0E-9			(cm^2)
L_{gw}	Depth to groundwater	2.1E+2			(cm)
L_s	Depth to top of affected soils	NA			(cm)
L_{base}	Depth to base of affected soils	NA			(cm)
L_{subs}	Thickness of affected soils	NA			(cm)
pH	Soil/groundwater pH	6.5E+0			(-)
		capillary	vadose	foundation	
θ_w	Volumetric water content	0.369	0.12	0.12	(-)
θ_a	Volumetric air content	0.041	0.29	0.26	(-)

Building Parameters		Residential	Commercial	(Units)
L_b	Building volume/area ratio	NA	NA	(cm)
A_b	Foundation area	NA	NA	(cm^2)
X_{crk}	Foundation perimeter	NA	NA	(cm)
ER	Building air exchange rate	NA	NA	(1/s)
L_{crk}	Foundation thickness	NA	NA	(cm)
Z_{crk}	Depth to bottom of foundation slab	NA	NA	(cm)
η	Foundation crack fraction	NA	NA	(-)
dP	Indoor/outdoor differential pressure	NA	NA	(g/cm/s^2)
Q_s	Convective air flow through slab	NA	NA	(cm^3/s)

Groundwater Parameters		Value	(Units)
δ_{gw}	Groundwater mixing zone depth	NA	(cm)
I_f	Net groundwater infiltration rate	NA	(in/yr)
U_{gw}	Groundwater Darcy velocity	NA	(cm/d)
V_{gw}	Groundwater seepage velocity	NA	(cm/d)
K_s	Saturated hydraulic conductivity	NA	(cm/d)
i	Groundwater gradient	NA	(-)
S_w	Width of groundwater source zone	NA	(cm)
S_d	Depth of groundwater source zone	NA	(cm)
θ_{ef}	Effective porosity in water-bearing unit	NA	(-)
f_{oc-sat}	Fraction organic carbon in water-bearing unit	NA	(-)
pH_{sat}	Groundwater pH	NA	(-)
	Biodegradation considered?	NA	

Transport Parameters		Off-site 1	Off-site 2	Off-site 1	Off-site 2	(Units)
Lateral Groundwater Transport		Groundwater Ingestion		Soil Leaching to GW		
α_x	Longitudinal dispersivity	NA	NA	NA	NA	(cm)
α_y	Transverse dispersivity	NA	NA	NA	NA	(cm)
α_z	Vertical dispersivity	NA	NA	NA	NA	(cm)
Lateral Outdoor Air Transport		Soil to Outdoor Air Inhal.		GW to Outdoor Air Inhal.		
σ_y	Transverse dispersion coefficient	NA	NA	NA	NA	(cm)
σ_z	Vertical dispersion coefficient	NA	NA	NA	NA	(cm)
ADF	Air dispersion factor	NA	NA	NA	NA	(-)

Surface Water Parameters		Off-site 2	(Units)
Q_{sw}	Surface water flowrate	NA	(cm^3/s)
W_{pl}	Width of GW plume at SW discharge	NA	(cm)
δ_{pl}	Thickness of GW plume at SW discharge	NA	(cm)
DF_{sw}	Groundwater-to-surface water dilution factor	NA	(-)

RBCA SITE ASSESSMENT

Site Name: EAKER AFB
Site Location: ARKANSAS

Completed By: Parsons ES, Denver, Co
Date Completed: 7-May-99

Job ID:

SOIL (6 - 25 ft) SSTL VALUES

Target Risk (Class A & B) 1.0E-6
Target Risk (Class C) 1.0E-5
Target Hazard Quotient 1.0E+0

Groundwater DAF Option:

SSTL Results For Complete Exposure Pathways ("X" If Complete)

				Soil Leaching to Groundwater Ingestion / Discharge to Surface Water			Soil Vol. to Indoor Air	X Soil Volatilization and Surface Soil Particulates to Outdoor Air				X Surface Soil Inhalation, Ingestion,Dermal Contact		Applicable SSTL	SSTL Exceeded ?	Required CRF
CONSTITUENTS OF CONCERN		Representative Concentration		On-site (0 ft)	Off-site 1 (0 ft)	Off-site 2 (0 ft)	On-site (0 ft)	On-site (0 ft)		Off-site 1 (0 ft)	Off-site 2 (0 ft)	On-site (0 ft)				Only if "yes" left
CAS No.	Name	(mg/kg)		None	None	None	None	~~Commercial~~ Construct	Construction Worker	#VALUE!	#VALUE!	~~Commercial~~ Construction	Construction Worker	(mg/kg)	"■" if yes	
71-43-2	Benzene			NA	NA	NA	NA	>4.2E+2	NA	NA	NA	2.6E+3	NA	2.6E+3	☐	NA
108-88-3	Toluene			NA	NA	NA	NA	>1.8E+2	NA	NA	NA	1.7E+5	NA	1.7E+5	☐	NA
100-41-4	Ethylbenzene			NA	NA	NA	NA	>1.2E+2	NA	NA	NA	1.2E+5	NA	1.2E+5	☐	NA
1330-20-7	Xylene (mixed isomers)			NA	NA	NA	NA	>1.0E+2	NA	NA	NA	1.0E+6	NA	1.0E+6	☐	NA
50-32-8	Benzo(a)Pyrene			NA	NA	NA	NA	>2.4E+0	NA	NA	NA	8.2E+1	NA	8.2E+1	☐	NA
91-20-3	Naphthalene			NA	NA	NA	NA	>9.3E+1	NA	NA	NA	1.0E+6	NA	1.0E+6	☐	NA
1634-04-4	Methyl t-Butyl ether			NA	NA	NA	NA	>7.7E+3	NA	NA	NA	9.8E+3	NA	9.8E+3	☐	NA

">" indicates risk-based target concentration greater than constituent residual saturation value. NA = Not applicable. NC = Not calculated.

RBCA SITE ASSESSMENT

Input Parameter Summary

Site Name: EAKER AFB
Site Location: ARKANSAS

Completed By: Parsons ES, Denver, Co
Date Completed: 7-May-99

Job ID:

Exposure Parameters		Residential			Commercial/Industrial	
		Adult	(1-6yrs)	(1-16 yrs)	Chronic	Construc.
AT_c	Averaging time for carcinogens (yr)	70				
AT_n	Averaging time for non-carcinogens (yr)	30			1	1
BW	Body weight (kg)	70	15	35	70	
ED	Exposure duration (yr)	30	6	16	1	1
τ	Averaging time for vapor flux (yr)	30			1	1
EF	Exposure frequency (days/yr)	350			7	180
EF_D	Exposure frequency for dermal exposure	350			7	
IR_w	Ingestion rate of water (L/day)	2			1	
IR_s	Ingestion rate of soil (mg/day)	100	200		100	100
IR_{air-in}	Inhalation rate indoor (m^3/day)	15			20	
$IR_{air-Out}$	Inhalation rate outdoor (m^3/day)	20			10	10
SA	Skin surface area (dermal) (cm^2)	5800		2023	5800	5800
M	Soil to skin adherence factor	1				
ET_{swim}	Swimming exposure time (hr/event)	3				
EV_{swim}	Swimming event frequency (events/yr)	12	12	12		
IR_{swim}	Water ingestion while swimming (L/hr)	0.05	0.5			
SA_{swim}	Skin surface area for swimming (cm^2)	23000		8100		
IR_{fish}	Ingestion rate of fish (kg/yr)	0.025				
FI_{fish}	Contaminated fish fraction (unitless)	1				

Complete Exposure Pathways and Receptors	On-site	Off-site 1	Off-site 2
Groundwater:			
Groundwater Ingestion	None	None	None
Soil Leaching to Groundwater Ingestion	None	None	None
Applicable Surface Water Exposure Routes:			
Swimming			NA
Fish Consumption			NA
Aquatic Life Protection			NA
Soil:			
Direct Ingestion and Dermal Contact	Commercial		
Outdoor Air:			
Particulates from Surface Soils	Commercial	#VALUE!	#VALUE!
Volatilization from Soils	Commercial	#VALUE!	#VALUE!
Volatilization from Groundwater	None	None	None
Indoor Air:			
Volatilization from Subsurface Soils	None	NA	NA
Volatilization from Groundwater	None	NA	NA

Receptor Distance from Source Media	On-site	Off-site 1	Off-site 2	(Units)
Groundwater receptor	NA	NA	NA	(ft)
Soil leaching to groundwater receptor	NA	NA	NA	(ft)
Outdoor air inhalation receptor	0	NA	NA	(ft)

Target Health Risk Values		Individual	Cumulative
TR_{ab}	Target Risk (class A&B carcinogens)	1.0E-6	1.0E-5
TR_c	Target Risk (class C carcinogens)	1.0E-5	
THQ	Target Hazard Quotient (non-carcinogenic risk)	1.0E+0	1.0E+0

Modeling Options	
RBCA tier	Tier 2
RBCA calculation mode	Backward Only
Risk goal calculation option	Individual & Cumulative Constituent Risks
Soil volatilization model option	Surface model only
Use soil attenuation model (SAM) for leachate?	NA
Air dilution factor	NA
Groundwater dilution-attenuation factor	NA

NOTE: NA = Not applicable

Surface Parameters		General	Construction	(Units)
A	Source zone area	9.6E+1	NA	(ft^2)
W	Length of source-zone area parallel to wind	2.4E+1	NA	(ft)
W_{gw}	Length of source-zone area parallel to GW flow	NA		(ft)
U_{air}	Ambient air velocity in mixing zone	7.4E+0		(ft/s)
δ_{air}	Air mixing zone height	6.6E+0		(ft)
P_a	Areal particulate emission rate	6.9E-14		(g/cm^2/s)
L_{ss}	Thickness of affected surface soils	NA		(ft)

Surface Soil Column Parameters		Value			(Units)
h_{cap}	Capillary zone thickness	NA			(ft)
h_v	Vadose zone thickness	NA			(ft)
ρ_b	Soil bulk density	1.7E+0			(g/cm^3)
f_{oc}	Fraction organic carbon	1.4E-3			(-)
θ_T	Soil total porosity	3.6E-1			(-)
K_{vs}	Vertical hydraulic conductivity	8.6E-1			(cm/d)
k_v	Vapor permeability	1.1E-14			(ft^2)
L_{gw}	Depth to groundwater	NA			(ft)
L_s	Depth to top of affected soils	6.0E+0			(ft)
L_{base}	Depth to base of affected soils	2.5E+1			(ft)
L_{subs}	Thickness of affected soils	1.9E+1			(ft)
pH	Soil/groundwater pH	6.5E+0			(-)
		capillary	vadose	foundation	
θ_w	Volumetric water content	0.324	0.24	0.12	(-)
θ_a	Volumetric air content	0.036	0.12	0.26	(-)

Building Parameters		Residential	Commercial	(Units)
L_b	Building volume/area ratio	NA	NA	(ft)
A_b	Foundation area	NA	NA	(cm^2)
X_{crk}	Foundation perimeter	NA	NA	(ft)
ER	Building air exchange rate	NA	NA	(1/s)
L_{crk}	Foundation thickness	NA	NA	(ft)
Z_{crk}	Depth to bottom of foundation slab	NA	NA	(ft)
η	Foundation crack fraction	NA	NA	(-)
dP	Indoor/outdoor differential pressure	NA	NA	(g/cm/s^2)
Q_s	Convective air flow through slab	NA	NA	(ft^3/s)

Groundwater Parameters		Value	(Units)
δ_{gw}	Groundwater mixing zone depth	NA	(ft)
I_f	Net groundwater infiltration rate	NA	(in/yr)
$U_{...}$	Groundwater Darcy velocity	NA	(cm/d)
$v_{...}$	Groundwater seepage velocity	NA	(cm/d)
K_s	Saturated hydraulic conductivity	NA	(cm/d)
i	Groundwater gradient	NA	(-)
S_w	Width of groundwater source zone	NA	(ft)
S_d	Depth of groundwater source zone	NA	(ft)
θ_{ef}	Effective porosity in water-bearing unit	NA	(-)
$f_{oc\text{-}sat}$	Fraction organic carbon in water-bearing unit	NA	(-)
pH_{sat}	Groundwater pH	NA	(-)
	Biodegradation considered?	NA	

Transport Parameters		Off-site 1	Off-site 2	Off-site 1	Off-site 2	(Units)
Lateral Groundwater Transport		Groundwater Ingestion		Soil Leaching to GW		
α_x	Longitudinal dispersivity	NA	NA	NA	NA	(ft)
α_y	Transverse dispersivity	NA	NA	NA	NA	(ft)
α_z	Vertical dispersivity	NA	NA	NA	NA	(ft)
Lateral Outdoor Air Transport		Soil to Outdoor Air Inhal.		GW to Outdoor Air Inhal.		
σ_y	Transverse dispersion coefficient	NA	NA	NA	NA	(ft)
σ_z	Vertical dispersion coefficient	NA	NA	NA	NA	(ft)
ADF	Air dispersion factor	NA	NA	NA	NA	(-)

Surface Water Parameters		Off-site 2	(Units)
Q_{sw}	Surface water flowrate	NA	(ft^3/s)
W_{pl}	Width of GW plume at SW discharge	NA	(ft)
δ_{pl}	Thickness of GW plume at SW discharge	NA	(ft)
DF_{sw}	Groundwater-to-surface water dilution factor	NA	(-)

RBCA SITE ASSESSMENT

Site Name: EAKER AFB | Completed By: Parsons ES, Denver, Co | Job ID:

Site Location: ARKANSAS | Date Completed: 17-Aug-99

SOIL (14.7 - 19 ft) SSTL VALUES

Target Risk (Class A & B) 1.0E-6
Target Risk (Class C) 1.0E-5
Target Hazard Quotient 1.0E+0

Groundwater DAF Option:

SSTL Results For Complete Exposure Pathways ("X" if Complete)

			Soil Leaching to Groundwater Ingestion / Discharge to Surface Water			X Soil Vol. to Indoor Air	Soil Volatilization and Surface Soil Particulates to Outdoor Air				Surface Soil Ingestion and Dermal Contact		Applicable SSTL	SSTL Exceeded ?	Required CRF
CONSTITUENTS OF CONCERN		Representative Concentration	On-site (0 ft)	Off-site 1 (0 ft)	Off-site 2 (0 ft)	On-site (0 ft)	On-site (0 ft)		Off-site 1 (0 ft)	Off-site 2 (0 ft)	On-site (0 ft)				Only if "yes" left
CAS No.	Name	(mg/kg)	None	None	None	Commercial	None	Construction Worker	None	None	None	Construction Worker	(mg/kg)	"■" if yes	
71-43-2	Benzene		NA	NA	NA	1.2E-1	NA	NA	NA	NA	NA	NA	1.2E-1	☐	NA
108-88-3	Toluene		NA	NA	NA	1.4E+2	NA	NA	NA	NA	NA	NA	1.4E+2	☐	NA
100-41-4	Ethylbenzene		NA	NA	NA	>1.2E+2	NA	NA	NA	NA	NA	NA	>1.2E+2	☐	NA
1330-20-7	Xylene (mixed isomers)		NA	NA	NA	>1.0E+2	NA	NA	NA	NA	NA	NA	>1.0E+2	☐	NA
50-32-8	Benzo(a)Pyrene		NA	NA	NA	>2.4E+0	NA	NA	NA	NA	NA	NA	>2.4E+0	☐	NA
91-20-3	Naphthalene		NA	NA	NA	>9.3E+1	NA	NA	NA	NA	NA	NA	>9.3E+1	☐	NA
1634-04-4	Methyl t-Butyl ether		NA	NA	NA	1.6E+3	NA	NA	NA	NA	NA	NA	1.6E+3	☐	NA

">" indicates risk-based target concentration greater than constituent residual saturation value. NA = Not applicable. NC = Not calculated.

RBCA SITE ASSESSMENT

Input Parameter Summary

Site Name: EAKER AFB
Site Location: ARKANSAS

Completed By: Parsons ES, Denver, Co
Date Completed: 17-Aug-99

Job ID:

Exposure Parameters		Residential			Commercial/Industrial	
		Adult	(1-6yrs)	(1-16 yrs)	Chronic	Construc.
AT_c	Averaging time for carcinogens (yr)	70				
AT_n	Averaging time for non-carcinogens (yr)	30			25	1
BW	Body weight (kg)	70	15	35	70	
ED	Exposure duration (yr)	30	6	16	25	1
τ	Averaging time for vapor flux (yr)	30			25	1
EF	Exposure frequency (days/yr)	350			250	180
EF_D	Exposure frequency for dermal exposure	350			250	
IR_w	Ingestion rate of water (L/day)	2			1	
IR_s	Ingestion rate of soil (mg/day)	100	200		50	100
IR_{air-In}	Inhalation rate indoor (m^3/day)	15			20	
$IR_{air-Out}$	Inhalation rate outdoor (m^3/day)	20			20	10
SA	Skin surface area (dermal) (cm^2)	5800		2023	5800	5800
M	Soil to skin adherence factor	1				
ET_{swim}	Swimming exposure time (hr/event)	3				
EV_{swim}	Swimming event frequency (events/yr)	12	12	12		
IR_{swim}	Water ingestion while swimming (L/hr)	0.05	0.5			
SA_{swim}	Skin surface area for swimming (cm^2)	23000		8100		
IR_{fish}	Ingestion rate of fish (kg/yr)	0.025				
FI_{fish}	Contaminated fish fraction (unitless)	1				

Complete Exposure Pathways and Receptors	On-site	Off-site 1	Off-site 2
Groundwater:			
Groundwater Ingestion	None	None	None
Soil Leaching to Groundwater Ingestion	None	None	None
Applicable Surface Water Exposure Routes:			
Swimming			NA
Fish Consumption			NA
Aquatic Life Protection			NA
Soil:			
Direct Ingestion and Dermal Contact	None		
Outdoor Air:			
Particulates from Surface Soils	None	None	None
Volatilization from Soils	None	None	None
Volatilization from Groundwater	None	None	None
Indoor Air:			
Volatilization from Subsurface Soils	Commercial	NA	NA
Volatilization from Groundwater	None	NA	NA

Receptor Distance from Source Media	On-site	Off-site 1	Off-site 2	(Units)
Groundwater receptor	NA	NA	NA	(ft)
Soil leaching to groundwater receptor	NA	NA	NA	(ft)
Outdoor air inhalation receptor	NA	NA	NA	(ft)

Target Health Risk Values		Individual	Cumulative
TR_{ab}	Target Risk (class A&B carcinogens)	1.0E-6	1.0E-
TR_c	Target Risk (class C carcinogens)	1.0E-5	
THQ	Target Hazard Quotient (non-carcinogenic risk)	1.0E+0	1.0E+0

Modeling Options	
RBCA tier	Tier 2
RBCA calculation mode	Backward Only
Risk goal calculation option	Individual & Cumulative Constituent Risks
Soil volatilization model option	NA
Use soil attenuation model (SAM) for leachate?	NA
Air dilution factor	NA
Groundwater dilution-attenuation factor	NA

NOTE: NA = Not applicable

Surface Parameters		General	Construction	(Units)
A	Source zone area	NA	NA	(ft^2)
W	Length of source-zone area parallel to wind	NA	NA	(ft)
W_{gw}	Length of source-zone area parallel to GW flow	NA		(ft)
U_{air}	Ambient air velocity in mixing zone	NA		(ft/s)
δ_{air}	Air mixing zone height	NA		(ft)
P_a	Areal particulate emission rate	NA		(g/cm^2/s)
L_{ss}	Thickness of affected surface soils	NA		(ft)

Surface Soil Column Parameters		Value			(Units)
h_{cap}	Capillary zone thickness	NA			(ft)
h_v	Vadose zone thickness	NA			(ft)
ρ_s	Soil bulk density	1.7E+0			(g/cm^3)
f_{oc}	Fraction organic carbon	1.4E-3			(-)
θ_T	Soil total porosity	3.6E-1			(-)
K_{vs}	Vertical hydraulic conductivity	8.6E-1			(cm/d)
k_v	Vapor permeability	1.1E-14			(ft^2)
L_{gw}	Depth to groundwater	NA			(ft)
L_s	Depth to top of affected soils	1.5E+1			(ft)
L_{base}	Depth to base of affected soils	1.9E+1			(ft)
L_{subs}	Thickness of affected soils	4.3E+0			(ft)
pH	Soil/groundwater pH	6.5E+0			(-)
		capillary	vadose	foundation	
θ_w	Volumetric water content	0.324	0.24	0.12	(-)
θ_a	Volumetric air content	0.036	0.12	0.26	(-)

Building Parameters		Residential	Commercial	(Units)
L_b	Building volume/area ratio	NA	9.84E+0	(ft)
A_b	Foundation area	NA	7.53E+2	(cm^2)
X_{crk}	Foundation perimeter	NA	1.12E+2	(ft)
ER	Building air exchange rate	NA	2.30E-4	(1/s)
L_{crk}	Foundation thickness	NA	4.92E-1	(ft)
Z_{crk}	Depth to bottom of foundation slab	NA	4.92E-1	(ft)
η	Foundation crack fraction	NA	1.00E-2	(-)
dP	Indoor/outdoor differential pressure	NA	0.00E+0	(g/cm/s^2)
Q_s	Convective air flow through slab	NA	0.00E+0	(ft^3/s)

Groundwater Parameters		Value	(Units)
δ_{gw}	Groundwater mixing zone depth	NA	(ft)
I_f	Net groundwater infiltration rate	NA	(in/yr)
U_{gw}	Groundwater Darcy velocity	NA	(cm/d)
V_{gw}	Groundwater seepage velocity	NA	(cm/d)
K_s	Saturated hydraulic conductivity	NA	(cm/d)
i	Groundwater gradient	NA	(-)
S_w	Width of groundwater source zone	NA	(ft)
S_d	Depth of groundwater source zone	NA	(ft)
θ_{ef}	Effective porosity in water-bearing unit	NA	(-)
f_{oc-sat}	Fraction organic carbon in water-bearing unit	NA	(-)
pH_{sat}	Groundwater pH	NA	(-)
	Biodegradation considered?	NA	

Transport Parameters		Off-site 1	Off-site 2	Off-site 1	Off-site 2	(Units)
Lateral Groundwater Transport		Groundwater Ingestion		Soil Leaching to GW		
α_x	Longitudinal dispersivity	NA	NA	NA	NA	(ft)
α_y	Transverse dispersivity	NA	NA	NA	NA	(ft)
α_z	Vertical dispersivity	NA	NA	NA	NA	(ft)
Lateral Outdoor Air Transport		Soil to Outdoor Air Inhal.		GW to Outdoor Air Inhal.		
σ_y	Transverse dispersion coefficient	NA	NA	NA	NA	(ft)
σ_z	Vertical dispersion coefficient	NA	NA	NA	NA	(ft)
ADF	Air dispersion factor	NA	NA	NA	NA	(-)

Surface Water Parameters		Off-site 2	(Units)
Q_{sw}	Surface water flowrate	NA	(ft^3/s)
W_{gw}	Width of GW plume at SW discharge	NA	(ft)
δ_{gw}	Thickness of GW plume at SW discharge	NA	(ft)
DF_{sw}	Groundwater-to-surface water dilution factor	NA	(-)

RBCA SITE ASSESSMENT

Site Name: EAKER AFB | Completed By: Parsons ES, Denver, Co | Job ID:

Site Location: ARKANSAS | Date Completed: 7-May-99

SOIL (14.7 - 19 ft) SSTL VALUES

Target Risk (Class A & B) 1.0E-6
Target Risk (Class C) 1.0E-5
Target Hazard Quotient 1.0E+0

Groundwater DAF Option:

SSTL Results For Complete Exposure Pathways ("X" if Complete)

CONSTITUENTS OF CONCERN		Representative Concentration	Soil Leaching to Groundwater Ingestion / Discharge to Surface Water			Soil Vol. to Indoor Air	X Soil Volatilization to Outdoor Air				Surface Soil Ingestion and Dermal Contact		Applicable SSTL	SSTL Exceeded ?	Required CRF
			On-site (0 ft)	Off-site 1 (0 ft)	Off-site 2 (0 ft)	On-site (0 ft)	On-site (0 ft)		Off-site 1 (0 ft)	Off-site 2 (0 ft)	On-site (0 ft)				Only if "yes" left
CAS No.	Name	(mg/kg)	None	None	None	None	~~Commercial~~ Construction	Construction Worker	#VALUE!	#VALUE!	~~None~~ Constr.	Construction Worker	(mg/kg)	"■" if yes	
71-43-2	Benzene		NA	NA	NA	NA	1.9E+2	NA	NA	NA	NA	NA	1.9E+2	☐	NA
108-88-3	Toluene		NA	NA	NA	NA	>1.8E+2	NA	NA	NA	NA	NA	>1.8E+2	☐	NA
100-41-4	Ethylbenzene		NA	NA	NA	NA	>1.2E+2	NA	NA	NA	NA	NA	>1.2E+2	☐	NA
1330-20-7	Xylene (mixed isomers)		NA	NA	NA	NA	>1.0E+2	NA	NA	NA	NA	NA	>1.0E+2	☐	NA
50-32-8	Benzo(a)Pyrene		NA	NA	NA	NA	>2.4E+0	NA	NA	NA	NA	NA	>2.4E+0	☐	NA
91-20-3	Naphthalene		NA	NA	NA	NA	>9.3E+1	NA	NA	NA	NA	NA	>9.3E+1	☐	NA
1634-04-4	Methyl t-Butyl ether		NA	NA	NA	NA	>7.7E+3	NA	NA	NA	NA	NA	>7.7E+3	☐	NA

">" indicates risk-based target concentration greater than constituent residual saturation value. NA = Not applicable. NC = Not calculated.

RBCA SITE ASSESSMENT

Input Parameter Summary

Site Name: EAKER AFB
Site Location: ARKANSAS

Completed By: Parsons ES, Denver, Co
Date Completed: 7-May-99

Job ID:

Exposure Parameters		Residential			Commercial/Industrial	
		Adult	(1-6yrs)	(1-16 yrs)	Chronic	Construc.
AT_c	Averaging time for carcinogens (yr)	70				
AT_n	Averaging time for non-carcinogens (yr)	30			1	1
BW	Body weight (kg)	70	15	35	70	
ED	Exposure duration (yr)	30	6	16	1	1
τ	Averaging time for vapor flux (yr)	30			1	1
EF	Exposure frequency (days/yr)	350			64	180
EF_D	Exposure frequency for dermal exposure	350			64	
IR_w	Ingestion rate of water (L/day)	2			1	
IR_s	Ingestion rate of soil (mg/day)	100	200		100	100
IR_{air-in}	Inhalation rate indoor (m^3/day)	15			20	
$IR_{air-Out}$	Inhalation rate outdoor (m^3/day)	20			10	10
SA	Skin surface area (dermal) (cm^2)	5800		2023	5800	5800
M	Soil to skin adherence factor	1				
ET_{swim}	Swimming exposure time (hr/event)	3				
EV_{swim}	Swimming event frequency (events/yr)	12	12	12		
IR_{swim}	Water ingestion while swimming (L/hr)	0.05	0.5			
SA_{swim}	Skin surface area for swimming (cm^2)	23000		8100		
IR_{fish}	Ingestion rate of fish (kg/yr)	0.025				
FI_{fish}	Contaminated fish fraction (unitless)	1				

Complete Exposure Pathways and Receptors	On-site	Off-site 1	Off-site 2
Groundwater:			
Groundwater Ingestion	None	None	None
Soil Leaching to Groundwater Ingestion	None	None	None
Applicable Surface Water Exposure Routes:			
Swimming			NA
Fish Consumption			NA
Aquatic Life Protection			NA
Soil:			
Direct Ingestion and Dermal Contact	None		
Outdoor Air:			
Particulates from Surface Soils	None	None	None
Volatilization from Soils	Commercial	#VALUE!	#VALUE!
Volatilization from Groundwater	None	None	None
Indoor Air:			
Volatilization from Subsurface Soils	None	NA	NA
Volatilization from Groundwater	None	NA	NA

Receptor Distance from Source Media	On-site	Off-site 1	Off-site 2	(Units)
Groundwater receptor	NA	NA	NA	(ft)
Soil leaching to groundwater receptor	NA	NA	NA	(ft)
Outdoor air inhalation receptor	0	NA	NA	(ft)

Target Health Risk Values		Individual	Cumulative
TR_{ab}	Target Risk (class A&B carcinogens)	1.0E-6	1.0E-5
TR_c	Target Risk (class C carcinogens)	1.0E-5	
THQ	Target Hazard Quotient (non-carcinogenic risk)	1.0E+0	1.0E+0

Modeling Options	
RBCA tier	Tier 2
RBCA calculation mode	Backward Only
Risk goal calculation option	Individual & Cumulative Constituent Risks
Soil volatilization model option	Surface model only
Use soil attenuation model (SAM) for leachate?	NA
Air dilution factor	NA
Groundwater dilution-attenuation factor	NA

NOTE: NA = Not applicable

Surface Parameters		General	Construction	(Units)
A	Source zone area	2.0E+3	NA	(ft^2)
W	Length of source-zone area parallel to wind	4.7E+1	NA	(ft)
W_{gw}	Length of source-zone area parallel to GW flow	NA		(ft)
U_{air}	Ambient air velocity in mixing zone	7.4E+0		(ft/s)
δ_{air}	Air mixing zone height	6.6E+0		(ft)
P_a	Areal particulate emission rate	NA		(g/cm^2/s)
L_{ss}	Thickness of affected surface soils	NA		(ft)

Surface Soil Column Parameters		Value			(Units)
h_{cap}	Capillary zone thickness	NA			(ft)
h_v	Vadose zone thickness	NA			(ft)
ρ_s	Soil bulk density	1.7E+0			(g/cm^3)
f_{oc}	Fraction organic carbon	1.4E-3			(-)
θ_T	Soil total porosity	3.6E-1			(-)
K_{vs}	Vertical hydraulic conductivity	8.6E-1			(cm/d)
k_v	Vapor permeability	1.1E-14			(ft^2)
L_{gw}	Depth to groundwater	NA			(ft)
L_s	Depth to top of affected soils	1.5E+1			(ft)
L_{base}	Depth to base of affected soils	1.9E+1			(ft)
L_{subs}	Thickness of affected soils	4.3E+0			(ft)
pH	Soil/groundwater pH	6.5E+0			(-)
		capillary	vadose	foundation	
θ_w	Volumetric water content	0.324	0.24	0.12	(-)
θ_a	Volumetric air content	0.036	0.12	0.26	(-)

Building Parameters		Residential	Commercial	(Units)
L_b	Building volume/area ratio	NA	NA	(ft)
A_b	Foundation area	NA	NA	(cm^2)
X_{crk}	Foundation perimeter	NA	NA	(ft)
ER	Building air exchange rate	NA	NA	(1/s)
L_{crk}	Foundation thickness	NA	NA	(ft)
Z_{crk}	Depth to bottom of foundation slab	NA	NA	(ft)
η	Foundation crack fraction	NA	NA	(-)
dP	Indoor/outdoor differential pressure	NA	NA	(g/cm/s^2)
Q_s	Convective air flow through slab	NA	NA	(ft^3/s)

Groundwater Parameters		Value	(Units)
δ_{gw}	Groundwater mixing zone depth	NA	(ft)
I_f	Net groundwater infiltration rate	NA	(in/yr)
U_{gw}	Groundwater Darcy velocity	NA	(cm/d)
V_{gw}	Groundwater seepage velocity	NA	(cm/d)
K_s	Saturated hydraulic conductivity	NA	(cm/d)
i	Groundwater gradient	NA	(-)
S_w	Width of groundwater source zone	NA	(ft)
S_d	Depth of groundwater source zone	NA	(ft)
θ_{eff}	Effective porosity in water-bearing unit	NA	(-)
f_{oc-sat}	Fraction organic carbon in water-bearing unit	NA	(-)
pH_{sat}	Groundwater pH	NA	(-)
	Biodegradation considered?	NA	

Transport Parameters		Off-site 1	Off-site 2	Off-site 1	Off-site 2	(Units)
Lateral Groundwater Transport		Groundwater Ingestion		Soil Leaching to GW		
α_x	Longitudinal dispersivity	NA	NA	NA	NA	(ft)
α_y	Transverse dispersivity	NA	NA	NA	NA	(ft)
α_z	Vertical dispersivity	NA	NA	NA	NA	(ft)
Lateral Outdoor Air Transport		Soil to Outdoor Air Inhal.		GW to Outdoor Air Inhal.		
σ_y	Transverse dispersion coefficient	NA	NA	NA	NA	(ft)
σ_z	Vertical dispersion coefficient	NA	NA	NA	NA	(ft)
ADF	Air dispersion factor	NA	NA	NA	NA	(-)

Surface Water Parameters		Off-site 2	(Units)
Q_{sw}	Surface water flowrate	NA	(ft^3/s)
W_{gw}	Width of GW plume at SW discharge	NA	(ft)
δ_{gw}	Thickness of GW plume at SW discharge	NA	(ft)
DF_{sw}	Groundwater-to-surface water dilution factor	NA	(-)

TIER 1A SITE-SPECIFIC RISK-BASED SCREENING LEVELS

Eaker AFB
Arkansas

Media	Exposure Pathway	Land Use	Type of Risk	**Benzene**	**Ethyl-benzene**	**Toluene**	**Xylenes**
SURFICIAL SOIL [mg/kg]	Ingestion/ Dermal/ Inhalation	Residential	Carcinogenic	4.1E+00			
			Hazard	3.5E+01	2.1E+03	4.1E+03	3.7E+04
		Industrial	Carcinogenic	1.2E+01			
			Hazard	2.4E+02	1.5E+04	2.8E+04	2.5E+05
SUB-SURFACE SOIL [mg/kg]	Leachate to Groundwater Ingestion (MCLs)			9.7E-02	3.8E+01	3.4E+01	SAT
SOIL VAPOR [ug/m^3]	Indoor Air Inhalation	Residential	Carcinogenic	3.2E+03			
			Hazard	2.5E+04	>VP	>VP	>VP
		Industrial	Carcinogenic	4.2E+04			
			Hazard	>VP	>VP	>VP	>VP
GROUND WATER [mg/l]	Groundwater Ingestion (MCLs)			5.0E-03	6.8E-01	1.0E+00	1.0E+01
	Vapor Intrusion to Buildings	Residential	Carcinogenic	2.0E-02			
			Hazard	1.6E-01	2.4E+01	9.4E+00	1.8E+01
		Industrial	Carcinogenic	5.2E-01			
			Hazard	1.1E+01	>Sol	>Sol	>Sol

Input Parameters

SITE INFORMATION:	Enter values in unshaded cells only
Site Name	Eaker AFB
Site Address	Arkansas

		Risk Scenario		
		Residential/ Commercial		Industrial
TARGET RISK LEVELS:	Units	Value for ADULT	Value for CHILD	Value for Industrial
Target risk	unitless	1.0E-06	= *adult res.*	1.0E-06
Target hazard quotient	unitless	1.0	= *adult res.*	1.0

		Residential/ Commercial		Industrial
EXPOSURE PARAMETERS	Units	Value for ADULT	Value for CHILD	Value for Industrial
Averaging Time for Carcinogens	yr	70	= adult res.	= adult res.
Averaging Time for Non-Carcinogens	yr	24	6	30
Body Weight	kg	70	15	70
Exposure duration	yr	24	6	25
Exposure frequency	d/yr	350	350	250
Exposure time for indoor air	hr/d	24	24	8
Exposure time for outdoor air	hr/d	8	8	8
Soil Ingestion rate	mg/d	100	200	50
Daily indoor inhalation rate	m^3/d	15	15	20
Daily outdoor inhalation rate	m^3/d	20	15	20
Daily water ingestion rate	L/d	2	2	1
Soil to skin adherence factor	mg/cm^2	0.5	0.5	0.5
Skin surface area for soil exposure	cm^2	3160	2190	3160

Input Parameters

SATURATED ZONE PARAMETERS: (Domenico Model)	Units	Residential/ Commercial		Industrial
		Value for ADULT	Value for CHILD	Value for Industrial
Groundwater Darcy Velocity	cm/yr	1800	=adult res.	=adult res.
Groundwater mixing zone thickness	cm	200	=adult res.	=adult res.
Distance downgradient	cm	1000	=adult res.	=adult res.
Effective porosity in aquifer	cm^3/cm^3	0.25	=adult res.	=adult res.
Length of source area parallel to wind or groundwater flow direction	cm	1000	=adult res.	=adult res.
Width of source perpendicular to direction of groundwater flow	cm	1000	=adult res.	=adult res.
Longitudinal dispersivity Calculated from distance (= 0.10*X)	cm	100	=adult res.	=adult res.
Transverse dispersivity Calculated from distance (= alphaX/3)	cm	33	=adult res.	=adult res.
Vertical dispersivity Calculated from distance (= alphaX/20)	cm	5	=adult res.	=adult res.

UNSATURATED ZONE PARAMETERS:	Units	Residential/ Commercial		Industrial
		Value for ADULT	Value for CHILD	Value for Industrial
Lower depth of surficial soil	cm	100.0	=adult res.	=adult res.
Fraction organic carbon	g oc/g soil	0.00141	=adult res.	=adult res.
Infiltration rate	cm/yr	5	=adult res.	=adult res.
Distance between foundation and soil vapor source	cm	100	=adult res.	=adult res.
Volumetric air content in unsaturated zone	cm^3/cm^3	0.3	=adult res.	=adult res.
Total soil porosity unsaturated zone	cm^3/cm^3	0.45	=adult res.	=adult res.
Volumetric water content in unsaturated zone	cm^3/cm^3	0.15	=adult res.	=adult res.
Soil bulk density	g/cm^3	1.40	=adult res.	=adult res.

Input Parameters

VOLATILIZATION FROM GROUNDWATER:	Units	Residential/ Commercial: Value for ADULT	Residential/ Commercial: Value for CHILD	Industrial: Value for Industrial
Depth to groundwater (Hcap+Hv)	cm	38[illegible]	=adult res.	=adult res.
Volumetric air content in capillary fringe soils	cm^3/cm^3	0.038	=adult res.	=adult res.
Volumetric water content in capillary fringe	cm^3/cm^3	0.342	=adult res.	=adult res.
Thickness of capillary fringe	cm	5	=adult res.	=adult res.
Thickness of unstaturated zone	cm	375	=adult res.	=adult res.

OUTDOOR AND INDOOR VOLATILIZATION/BUILDING PARAMETERS:	Units	Residential/ Commercial: Value for ADULT	Residential/ Commercial: Value for CHILD	Industrial: Value for Industrial
Air exchange rate with outside air	1/s	1.40E-04	=adult res.	2.30E-04
Enclosed-space volume/infiltration area ratio	cm	200	=adult res.	488
Enclosed-space foundation or wall thickness	cm	15	=adult res.	15
Areal fraction of cracks in foundations/walls	cm^2/cm^2	0.01	=adult res.	0.01
Vol. air content in foundation/wall cracks	cm^3/cm^3	0.26	=adult res.	=adult res.
Vol. water content in foundation/wall cracks	cm^3/cm^3	0.12	=adult res.	=adult res.
Particulate emission rate	g/cm^2-s	6.90E-14	=adult res.	6.9E-14
Wind speed above ground surface in ambient mixing zone	cm/s	370	=adult res.	=adult res.
Ambient air mixing zone height	cm	200	=adult res.	=adult res.
Length of source area parallel to wind or groundwater flow direction	cm	1000	=adult res.	=adult res.

OUTDOOR AND INDOOR SOIL GAS PARAMETERS:	Units	Residential/ Commercial: Value for ADULT	Residential/ Commercial: Value for CHILD	Industrial: Value for Industrial
Total building area	cm^2	7.40E+05	=adult res.	1.16E+06
Building volume including basement of crawl space	cm^3	3.60E+08	=adult res.	5.60E+08
Building under-pressurization	$g/cm\text{-}sec^2$	1.00E+01	=adult res.	=adult res.
Air viscosity	g/cm-sec	1.80E-04	=adult res.	=adult res.
Total floor-wall seam perimeter distance	cm	3.70E+03	=adult res.	4.60E+03
Distance below ground surface of the basement cracks	cm	244	=adult res.	=adult res.
Soil air permeability	cm^2	1.00E-08	=adult res.	=adult res.

Chemical Properties

	Units	Benzene	Ethyl-benzene	Toluene	Xylenes	Acenaph-thene	Acenaph-thylene	Anthra-cene
Toxicity Data:								
Slope Factor Oral	1/(mg/kg-d)	2.90E-02	ND	ND	ND	ND	ND	ND
Slope Factor Inhalation	1/(mg/kg-d)	2.90E-02	ND	ND	ND	ND	ND	ND
RfD Oral	mg/kg-d	1.70E-03	1.00E-01	2.00E-01	2.00E+00	6.00E-02	ND	3.00E-01
RfD Inhalation	mg/kg-d	1.70E-03	2.90E-01	1.14E-01	2.00E-01	6.00E-02	ND	3.00E-01
Absorption Adjustment Factor: Oral-Soil	-	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
Absorption Adjustment Factor: Oral-Water	-	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
Absorption Adjustment Factor: Dermal-Soil	-	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-02	5.00E-02	5.00E-02
Absorption Adjustment Factor: Dermal-Water	-	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
Absorption Adjustment Factor: Inhalation	-	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
Fate and Transport Parameters:								
Solubility	mg/L	1.75E+03	1.69E+02	5.26E+02	1.98E+02	4.24E+00	3.93E+00	4.34E-02
Henry's Law Constant (no NDs)	-	2.28E-01	3.23E-01	2.72E-01	2.90E-01	6.36E-03	4.67E-03	2.67E-03
Koc (for organics, ND for inorganics)	ml/g	5.89E+01	3.63E+02	1.82E+02	2.40E+02	7.08E+03	4.79E+03	2.95E+04
Kd (partition coefficient for inorganics)	ml/g	ND	ND	ND	ND	ND	ND	ND
Diffusion Coeff. in Air	cm^2/s	8.80E-02	7.50E-02	8.70E-02	7.20E-02	4.21E-02	5.40E-02	3.24E-02
Diffusion Coefficient in Water	cm^2/s	9.80E-06	7.80E-06	8.60E-06	8.50E-06	7.69E-06	6.60E-06	7.74E-06
log Kow -- Octanol/Water Partition Coefficient	L/kg	2.13E+00	3.14E+00	2.75E+00	3.26E+00	3.92E+00	3.94E+00	4.55E+00
Degradation Rate in Aquifer	1/day	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.82E-02	8.20E-03	7.00E-03
Other Parameters								
CAS Number	-	71-43-2	100-41-4	108-88-3	1330-20-7	83-32-9	208-96-8	120-12-7
Molecular Weight	g/mol	78	106.2	92.10	106.2	154.2	152.2	178.2
Density	g/cm^3	0.88	0.87	8.67E-01	0.87	1.07	0.90	1.25
Vapor Pressure	mmHg	9.52E+01	9.60E+00	28.4	8.84E+00	2.30E-03	9.12E-04	2.67E-04
Carcinogenic Classification		A	D	D	D	ND	D	D
Temperature	°C	20	20	20	20	20	20	20
Universal Gas Constant - R	cm^3-atm/mol-°K	82.057	82.057	82.057	82.057	82.057	82.057	82.0
Vapor Concentration at Saturated Vapor Pressure	ug/m^3	4.06E+05	5.58E+04	1.43E+05	5.14E+04	1.94E+01	7.60E+00	2.60E+00
MCL	mg/l	5.00E-03	6.80E-01	1.00E+00	1.00E+01	ND	ND	ND
Saturated Soil Concentration:								
Soil concentration at saturated conditions	mg/kg	4.18E+02	1.16E+02	2.22E+02	1.01E+02	4.28E+01	2.70E+01	1.81E+00
Carcinogen?		TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Hazard?		TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	TRUE

References:

Fate & Transport Data

U.S. Environmental Protection Agency. 1994. Soil Screening Guidance, Office of Solid Waste and Emergency Response, EPA/540/R-94/101.

Toxicological Data

U.S. Environmental Protection Agency. 1996. Region 9 Preliminary Remediation Goals (PRGs). Region 9, San Francisco

Chemical Properties

	Units	Benz(a)-anthracene	Benzo(a)-pyrene	Benzo(b)-fluoranthene	Benzo(g,h,i)-perylene	Benzo(k)-fluoranthene	Chrysene	Dibenz(a,h)-anthracene
Toxicity Data:								
Slope Factor Oral	1/(mg/kg-d)	7.30E-01	7.30E+00	7.30E-01	ND	7.30E-02	7.30E-03	7.30E+00
Slope Factor Inhalation	1/(mg/kg-d)	7.30E-01	7.30E+00	7.30E-01	ND	7.30E-02	7.30E-03	7.30E+00
RfD Oral	mg/kg-d	ND	ND	ND	ND	ND	ND	ND
RfD Inhalation	mg/kg-d	ND	ND	ND	ND	ND	ND	ND
Absorption Adjustment Factor: Oral-Soil	-	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
Absorption Adjustment Factor: Oral-Water	-	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
Absorption Adjustment Factor: Dermal-Soil	-	5.00E-02	5.00E-02	5.00E-02	5.00E-02	5.00E-02	5.00E-02	5.00E-02
Absorption Adjustment Factor: Dermal-Water	-	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
Absorption Adjustment Factor: Inhalation	-	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
Fate and Transport Parameters:								
Solubility	mg/L	9.40E-03	1.62E-03	1.50E-03	2.60E-04	8.00E-04	1.60E-03	2.49E-03
Henry's Law Constant (no NDs)	-	1.37E-04	4.63E-05	4.55E-03	1.09E-05	3.40E-05	3.88E-03	6.03E-07
Koc (for organics, ND for inorganics)	ml/g	3.98E+05	1.02E+06	1.23E+06	7.76E+06	1.23E+06	3.98E+05	3.80E+06
Kd (partition coefficient for inorganics)	ml/g	ND	ND	ND	ND	ND	ND	ND
Diffusion Coeff. in Air	cm^2/s	5.10E-02	4.30E-02	2.26E-02	4.10E-02	2.26E-02	2.48E-02	2.02E-02
Diffusion Coefficient in Water	cm^2/s	9.00E-06	9.00E-06	5.56E-06	4.90E-06	5.56E-06	6.21E-06	5.18E-06
log Kow -- Octanol/Water Partition Coefficient	L/kg	5.70E+00	6.11E+00	6.20E+00	7.10E+00	6.20E+00	5.70E+00	6.69E+00
Degradation Rate in Aquifer	1/day	3.40E-03	6.08E-03	9.60E-04	5.87E-04	3.90E-04	9.34E-04	9.60E-04
Other Parameters								
CAS Number	-	56-55-3	50-32-8	205-99-2	191-24-2	207-08-9	218-01-9	53-70-3
Molecular Weight	g/mol	228	252.3	252.3	276.3	252.3	228.3	278.4
Density	g/cm^3	1.27	1.35	1.35	1.35	1.35	1.27	1.28
Vapor Pressure	mmHg	3.05E-08	5.49E-09	5.00E-07	1.01E-10	9.65E-10	6.23E-09	1.00E-10
EPA Carcinogenic Classification		B2	B2	B2	D	B2	B2	B2
Temperature	°C	20	20	20	20	20	20	20
Universal Gas Constant - R	cm^3-atm/mol-°K	82.057	82.057	82.057	82.057	82.057	82.057	82.057
Vapor Concentration at Saturated Vapor Pressure	ug/m^3	3.81E-04	7.58E-05	6.90E-03	1.53E-06	1.33E-05	7.78E-05	1.52E-06
MCL	mg/l	ND	1.00E-05	ND	ND	ND	ND	ND
Saturated Soil Concentration:								
Soil concentration at saturated conditions	mg/kg	5.28E+00	2.33E+00	2.60E+00	2.84E+00	1.39E+00	8.98E-01	1.33E+01
Carcinogen?		TRUE	TRUE	TRUE	FALSE	TRUE	TRUE	TRUE
Hazard?		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE

References:

Fate & Transport Data

U.S. Environmental Protection Agency. 1994. Soil Screening Guidance, Office of Solid Waste and Emergency Response, EPA/540/R-94/101.

Toxicological Data

U.S. Environmental Protection Agency. 1996. Region 9 Preliminary Remediation Goals (PRGs). Region 9, San Francisco

Chemical Properties

	Units	Flouran-thene	Fluorene	Indeno-(1,2,3-CD) pyrene	Naphthalene	Phenan-threne	Pyrene
Toxicity Data:							
Slope Factor Oral	1/(mg/kg-d)	ND	ND	7.30E-01	ND	ND	NC
Slope Factor Inhalation	1/(mg/kg-d)	ND	ND	7.30E-01	ND	ND	ND
RfD Oral	mg/kg-d	4.00E-02	4.00E-02	ND	4.00E-02	ND	3.00E-02
RfD Inhalation	mg/kg-d	4.00E-02	4.00E-02	ND	4.00E-02	ND	3.00E-02
Absorption Adjustment Factor: Oral-Soil	-	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
Absorption Adjustment Factor: Oral-Water	-	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
Absorption Adjustment Factor: Dermal-Soil	-	5.00E-02	5.00E-02	5.00E-02	5.00E-02	5.00E-02	5.00E-02
Absorption Adjustment Factor: Dermal-Water	-	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
Absorption Adjustment Factor: Inhalation	-	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
Fate and Transport Parameters:							
Solubility	mg/L	2.06E-01	1.98E+00	2.20E-05	3.10E+01	1.29E+00	1.35E-01
Henry's Law Constant (no NDs)	-	6.60E-04	2.61E-03	6.56E-05	1.98E-02	1.60E-03	4.51E-04
Koc (for organics, ND for inorganics)	ml/g	1.07E+05	1.38E+04	3.47E+06	2.00E+03	2.29E+04	1.05E+05
Kd (partition coefficient for inorganics)	ml/g	ND	ND	ND	ND	ND	ND
Diffusion Coeff. in Air	cm^2/s	3.02E-02	3.63E-02	1.90E-02	5.90E-02	5.17E-02	2.72E-02
Diffusion Coefficient in Water	cm^2/s	6.35E-06	7.88E-06	5.66E-06	7.50E-06	5.90E-06	7.24E-06
log Kow -- Octanol/Water Partition Coefficient	L/kg	5.12E+00	4.21E+00	6.65E+00	3.36E+00	4.57E+00	5.11E+00
Degradation Rate in Aquifer	1/day	2.50E-03	1.10E-02	5.80E-04	7.00E-01	2.20E-02	1.70E-03
Other Parameters							
CAS Number	-	206-44-0	86-73-7	193-39-5	91-20-3	85-01-8	129-00-0
Molecular Weight	g/mol	202.3	166.2	276.3	128.2	178.2	202.3
Density	g/cn	1.25	1.20	1.35	1.16	1.18	1.27
Vapor Pressure	mmHg	1.23E-08	8.42E-03	1.00E-10	8.50E-02	1.12E-04	2.45E-06
EPA Carcinogenic Classification		D	D	B2	D	D	D
Temperature	°C	20	20	20	20	20	20
Universal Gas Constant - R	cm^3-atm/mol-°K	82.057	82.057	82.057	82.057	82.057	82.057
Vapor Concentration at Saturated Vapor Pressure	ug/m^3	1.36E-04	7.66E+01	1.51E-06	5.96E+02	1.09E+00	2.71E-02
MCL	mg/l	ND	ND	ND	ND	ND	ND
Saturated Soil Concentration:							
Soil concentration at saturated conditions	mg/kg	3.11E+01	3.87E+01	1.08E-01	9.09E+01	4.18E+01	2.00E+01
Carcinogen?		FALSE	FALSE	TRUE	FALSE	FALSE	FALSE
Hazard?		TRUE	TRUE	FALSE	TRUE	FALSE	TRUE

References:

Fate & Transport Data

U.S. Environmental Protection Agency. 1994. Soil Screening Guidance, Office of Solid Waste and Emergency Response, EPA/540/R-94/101.

Toxicological Data

U.S. Environmental Protection Agency. 1996. Region 9 Preliminary Remediation Goals (PRGs). Region 9, San Francisco

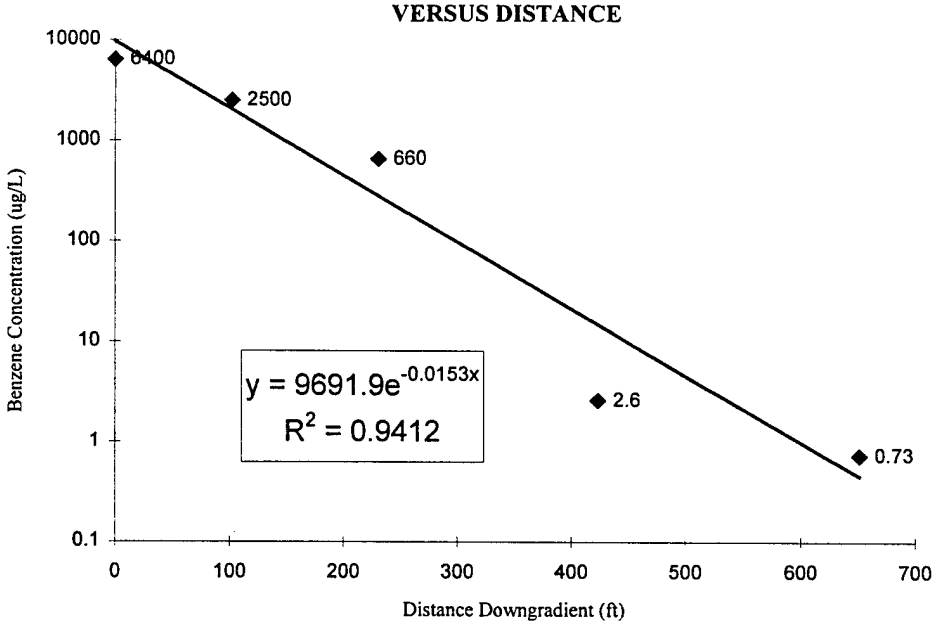
APPENDIX F

BATCH-FLUSH AND BIOSCREEN MODELING INPUT AND OUTPUT, AND SUPPORTING CALCULATIONS

FIRST-ORDER DECAY RATE CALCULATION
USING THE METHOD OF BUSCHECK AND ALCANTAR (1995)
FORMER MILITARY GAS STATION
EAKER AFB, ARKANSAS

Point	Distance (ft) Downgradient	Benzene (µg/L) Jun-99
MW012	0	6400
TW012I	102	2500
MW015I	231	660
TW016D	423	2.6
MW017	651	0.73

PLOT OF BENZENE CONCENTRATION VERSUS DISTANCE



$$\lambda = v_c/4\alpha_x([1+2\alpha_x(k/v_x)]^2-1)$$

dh/dl = 0.00077 ft/ft
K = 55 ft/day
n_e = 0.28
$V_g = K/n_e * dh/dl$ = 0.151 ft/day
R = 1.71
$V_c = V_g/R$ = 0.088 ft/day

where	v_c =	0.088	ft/day
	α_x =	23.4	feet
	k/v =	0.0153	
therefore	λ =	1.83E-03	days-1
	half-life =	1.04	years

```
**********************************************************************************
**********************************************************************************
**                                                                              **
**                                                                              **
**                HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE                 **
**                 HELP MODEL VERSION 3.01   (14 OCTOBER 1994)                  **
**                    DEVELOPED BY ENVIRONMENTAL LABORATORY                     **
**                      USAE WATERWAYS EXPERIMENT STATION                       **
**                FOR USEPA RISK REDUCTION ENGINEERING LABORATORY               **
**                                                                              **
**                                                                              **
**********************************************************************************
**********************************************************************************


PRECIPITATION DATA FILE:     C:\HELP3\PRECIP1.D4
TEMPERATURE DATA FILE:       C:\HELP3\TEMP1.D7
SOLAR RADIATION DATA FILE:   C:\HELP3\RAD1.D13
EVAPOTRANSPIRATION DATA:     C:\HELP3\ET1.D11
SOIL AND DESIGN DATA FILE:   C:\HELP3\SOIL1.D10
OUTPUT DATA FILE:            C:\HELP3\out1.OUT


TIME:  14:43     DATE:   8/ 2/1999


**********************************************************************************

    TITLE:  Eaker - Former Military Gas Station

**********************************************************************************


     NOTE:  INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER WERE
              COMPUTED AS NEARLY STEADY-STATE VALUES BY THE PROGRAM.


                                LAYER  1
                                --------

                TYPE 1 - VERTICAL PERCOLATION LAYER
                    MATERIAL TEXTURE NUMBER   0
          THICKNESS                    =     18.00   INCHES
          POROSITY                     =      0.3980 VOL/VOL
          FIELD CAPACITY               =      0.2440 VOL/VOL
          WILTING POINT                =      0.1360 VOL/VOL
          INITIAL SOIL WATER CONTENT   =      0.3544 VOL/VOL
          EFFECTIVE SAT. HYD. COND.    =  0.120000004000E-04 CM/SEC


                                LAYER  2
                                --------
```

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 0

THICKNESS	=	162.00	INCHES
POROSITY	=	0.4190	VOL/VOL
FIELD CAPACITY	=	0.3070	VOL/VOL
WILTING POINT	=	0.1800	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.3172	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.190000003000E-05	CM/SEC

LAYER 3

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 0

THICKNESS	=	156.00	INCHES
POROSITY	=	0.4370	VOL/VOL
FIELD CAPACITY	=	0.3730	VOL/VOL
WILTING POINT	=	0.2660	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.3727	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.360000001000E-06	CM/SEC

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS USER-SPECIFIED.

SCS RUNOFF CURVE NUMBER	=	74.00	
FRACTION OF AREA ALLOWING RUNOFF	=	80.0	PERCENT
AREA PROJECTED ON HORIZONTAL PLANE	=	0.065	ACRES
EVAPORATIVE ZONE DEPTH	=	22.0	INCHES
INITIAL WATER IN EVAPORATIVE ZONE	=	8.049	INCHES
UPPER LIMIT OF EVAPORATIVE STORAGE	=	8.840	INCHES
LOWER LIMIT OF EVAPORATIVE STORAGE	=	3.168	INCHES
INITIAL SNOW WATER	=	0.000	INCHES
INITIAL WATER IN LAYER MATERIALS	=	115.902	INCHES
TOTAL INITIAL WATER	=	115.902	INCHES
TOTAL SUBSURFACE INFLOW	=	0.00	INCHES/YEAR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
MEMPHIS TENNESSEE

MAXIMUM LEAF AREA INDEX	=	2.00
START OF GROWING SEASON (JULIAN DATE)	=	79
END OF GROWING SEASON (JULIAN DATE)	=	315
AVERAGE ANNUAL WIND SPEED	=	9.00 MPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY	=	68.00 %
AVERAGE 2ND QUARTER RELATIVE HUMIDITY	=	66.00 %
AVERAGE 3RD QUARTER RELATIVE HUMIDITY	=	70.00 %
AVERAGE 4TH QUARTER RELATIVE HUMIDITY	=	68.00 %

NOTE: PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR MEMPHIS TENNESSEE

NORMAL MEAN MONTHLY PRECIPITATION (INCHES)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
4.61	4.33	5.44	5.77	5.06	3.58
4.03	3.74	3.62	2.37	4.17	4.85

NOTE: TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR MEMPHIS TENNESSEE

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES FAHRENHEIT)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
39.60	43.50	51.70	62.60	71.00	78.70
82.10	80.60	74.20	62.90	51.30	43.30

NOTE: SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR MEMPHIS TENNESSEE

STATION LATITUDE = 35.03 DEGREES

****

AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1 THROUGH 20

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	4.48	4.91	5.34	5.15	5.87	3.80
	4.20	3.40	3.57	3.38	3.04	4.57
STD. DEVIATIONS	2.84	2.34	2.63	3.35	2.54	2.03
	2.59	2.18	1.83	1.58	1.53	2.63
RUNOFF						
TOTALS	1.739	1.923	2.071	1.511	2.200	0.951
	1.163	0.925	1.103	1.072	0.931	1.610
STD. DEVIATIONS	1.874	1.837	1.507	1.704	1.501	0.889
	1.335	0.757	0.873	0.914	0.837	1.583
EVAPOTRANSPIRATION						

TOTALS	1.234	1.633	2.614	3.308	4.795	4.149
	2.870	2.248	1.952	2.708	1.348	1.033
STD. DEVIATIONS	0.187	0.316	0.535	0.970	0.769	1.352
	1.210	1.244	0.731	0.457	0.522	0.155

PERCOLATION/LEAKAGE THROUGH LAYER 3

TOTALS	0.3023	0.2698	0.3021	0.2936	0.3007	0.2860
	0.2949	0.3043	0.2972	0.3076	0.3018	0.3155
STD. DEVIATIONS	0.1517	0.1358	0.1518	0.1470	0.1514	0.1455
	0.1459	0.1347	0.1295	0.1338	0.1289	0.1336

****

****

AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1 THROUGH 20

	INCHES		CU. FEET	PERCENT
PRECIPITATION	51.71	(7.904)	12201.4	100.00
RUNOFF	17.199	(4.6830)	4058.10	33.259
EVAPOTRANSPIRATION	29.891	(3.1955)	7052.68	57.802
PERCOLATION/LEAKAGE THROUGH FROM LAYER 3	3.57589	(1.63384)	843.731	6.91501
CHANGE IN WATER STORAGE	1.047	(2.8062)	246.93	2.024

****

□

****

PEAK DAILY VALUES FOR YEARS 1 THROUGH 20

	(INCHES)	(CU. FT.)
PRECIPITATION	4.72	1113.684
RUNOFF	3.430	809.2564
PERCOLATION/LEAKAGE THROUGH LAYER 3	0.012245	2.88932
SNOW WATER	3.72	877.8083

MAXIMUM VEG. SOIL WATER (VOL/VOL)	0.4018
MINIMUM VEG. SOIL WATER (VOL/VOL)	0.1366

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FINAL WATER STORAGE AT END OF YEAR 20

LAYER	(INCHES)	(VOL/VOL)
1	4.9891	0.2772
2	63.6906	0.3932
3	68.1530	0.4369
SNOW WATER	0.000	

****
****

TABLE 6.X
CALCULATION OF VERTICAL HYDRAULIC GRADIENTS IN AQUITARD
FORMER MILITARY GAS STATION
EAKER AFB, ARKANSAS

Well ID	Date	DTW from TOC (ft)	Elevation of TOC (ft amsl)	Groundwater Elevation (ft amsl)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	Ground Surface Elevation (ft amsl)	Elevation of Top of Screen (ft amsl)	Elevation of Bottom of Screen (ft amsl)	Screen Midpoint (ft amsl)	Corrected Screen Midpoint (ft amsl)
MW012	5/5/1999	9.49	249.86	240.37	27.6	32.6	250.03	222.43	217.43	219.93	219.93
MW003	5/5/1999	7.92	249.67	241.75	5.7	13.3	249.85	244.15	236.55	240.35	239.15
MW012	6/27/1999	11.36	249.86	238.50	27.6	32.6	250.03	222.43	217.43	219.93	219.93
MW003	6/27/1999	9.61	249.67	240.06	5.7	13.3	249.85	244.15	236.55	240.35	238.31

	5/5/1999	6/27/1999	
Vertical Gradient =	0.072	0.085	ft/ft
Hydraulic Conductivity =	0.005	0.005	ft/day
Effective Porosity =	0.08	0.08	
Vertical GW velocity =	0.004	0.005	ft/day
	1.6	1.9	ft/year

Contaminant Flushing Calculations--Simulated Batch Flush Model (Saturated)
Eaker AFB - Former Military Gas Station AQUITARD
Prepared by: JPT, 7/28/99

Calculations assume fuel residuals remain in soils at or below the water table and that groundwater is continuously moving through these soils. This results in the partitioning of contaminant compounds from the soil into the groundwater. This aquifer is modeled as a batch reactor in which clean groundwater enters contaminated soil which releases contaminants into the water based on the partitioning coefficient (K_d). Each pore volume of groundwater is then replaced with clean groundwater and the desorption cycle is repeated.

Knowns:

- Average horizontal hydraulic conductivity = 0.05 ft/day
- Horizontal hydraulic gradient = 0.007 ft/ft
- Vertical hydraulic gradient = 0.072 ft/ft
- Starting benzene concentration in groundwater = 2,700 g/L (maximum detected in Phase I & II investigations)
- Average soil TOC concentration = 1433 mg/kg = 1433 x 10^{-6} mg TOC/mg soil=0.001433 = f_{oc}
- K_{oc} for benzene = 79 L/kg (fuels protocol) or 38 L/kg (Bioscreen User's Manual)
- K_d for benzene = (f_{oc}) (K_{oc}) = 0.113 L/kg with K_{oc}= 79, and 0.054 L/kg with K_{oc}= 38
- Average rainfall of 48.3" per year (Parsons ES, 1997 - TS for BX Shoppette)

Assumptions:

- 100% of equilibrium will be reached with each flush (reasonable due to low groundwater migration velocity)
- Simulated reactor volume = volume of contaminated soil in the saturated zone at an average source area (assumed to approximate a circle with a diameter of 60 feet and a thickness of 15 feet)
- Vertical hydraulic conductivity is 10% of horizontal conductivity = 0.005 ft/day (Freeze & Cherry, 1979)
- Effective porosity = 0.08 (Johnson, 1967)
- Horizontal groundwater velocity = 1.59 ft/yr
- Vertical groundwater velocity = 1.64 ft/yr
- Total porosity = 0.45 (Wiedemeier, 1995)
- Soil bulk density = 1.40 g/cm^3 (Wiedemeier, 1995).

Contaminated soil volume = πr^2 = 3.14*(30 ft)^2 = 2,827 ft^2 * 15 ft (depth) = 42,400 ft^3 = 1,200 m^3

Mass of soil = (1.40 g/cm^3) (10^6 cm^3/m^3) (1kg/1000g) (1,200 m^3) = 1,680,000 kg = 1,400 kg/m^3

Mass of water = (1 g/cm^3) (0.45 cm^3 water/cm^3 aquifer) (10^6 cm^3/m^3) (1kg/1000g) (1,200 m^3) = 540,000 kg = 450 kg/m^3

CALCULATING TURNOVER TIME OR FLUSHING RATE

Mass Balance Approach:
Since vertical flow velocities are similar to horizontal flow velocities, the effects of precipitation are expected to be significant in the recharge of groundwater in the aquitard. Assuming an average annual rainfall of 48.3 inches (or 4.025 ft) over the contaminated area (2,827 ft^2) and an infiltration rate of 6.92% of total rainfall (from HELP model run), a total of 787 ft^3 of fresh water is available per year. A total thickness of approximately 20 ft of water exists within the aquitard, and the total porosity is 0.45. Therefore, the total volume of water in "storage" is = 20ft * 2,827 ft^2 * 0.45 = 25,450 ft^3. Using a mass balance approach, (water stored)/(recharge rate) = Turnover Time. So, (25,450 ft^3)/(787 ft^3/yr) = 32.3 years.

Groundwater Velocity Approach:
Assuming an unlimited supply of recharge water, migration distance/migration rate = Flushing rate.
So, (20 feet vertical travel distance)/(1.64 feet per year GW velocity) = 12.2 years.

Considering the two approaches to calculating turnover time, a new volume of water will pass through the seasonally-saturated soil mass approximately every 12.2 to 32.3 years (average = 22.3 years).

Equations:
K_d (ml/g) = soil concentration (µg g) / water concentration (µg/ml)
Therefore, water concentration (µg/ml) = soil concentration(µg/g) / K_d (ml/g)
Or, water concentration (mg/L) = soil concentration (mg/kg) / K_d (L/kg)
And, soil concentration (mg/kg) = water concentration (mg/L) * K_d (L/kg)

M(s) = mass of contaminant in soil
M(w) = mass of contaminant in water
M(s, new) = m(s,old) - m(w)
µg/kg = µg/kg - µg/L
Need to correct for density:
mass of water/mass of soil = 450 kg/m^3 / 1,400 kg/m^3 = 0.32 L/kg
Therefore, µg/kg remaining = µg/kg initial - [µg/L leached x 0.32 L/kg]

This equation is used to compute the decrease in soil benzene concentrations over time in the attached worksheet (worksheet - Table Calcs). The K_d value is used in combination with each new soil concentration to compute the resulting groundwater concentration. As described above, it is estimated that the equivalent of one pore volume of groundwater flushes through the seasonally saturated contaminated soil interval every 22.3 years. Therefore, 1/22.3 (or 0.0448) flushes occur each year.

According to this model, it would take approximately 52 years for physical flushing alone to reduce maximum groundwater benzene concentrations to less than 10 µg/L assuming a benzene K_d of 0.113 L/kg.

However, this model does not take biodegradation into account. The biodegradation rate computed for benzene in the saturated zone using the single-well (diminishing plume) method of Buscheck and Alcantar (1995) was 0.00011 day^{-1} corresponding to a half-life of 17 years (Parsons ES, 1999).

Based on observations made during the source area excavation in July 1999, the majority of soil contamination exists from approximately 6 to 12 feet below ground surface. Groundwater elevations measured in the aquitard ranged from approximately 7 to 10 feet bgs in May 1991. Considering this, it is reasonable to assume that the contaminated zone of soil is not saturated throughout the entire year. Assuming that the contaminated soil is distributed evenly within the range of groundwater elevations present throughout the year, it may be said that the contaminated soil is saturated only half of the year. Since biodegradation relies on the presence of water to support microbial life, biodegradation in the most contaminated zone of the aquitard may only occur during 6-months of every year. Although it is likely that contaminants are also being biodegraded during the other 6 months per year when the soils are not saturated given the presence of soil moisture in the vadose zone that can support microbial populations, to be conservative, for this analysis it is assumed that biodegradation only occurs during the 6 months of saturation. Therefore, the actual biodegradation rate in the seasonally-saturated zone may be 50 percent of the computed rate (0.000055 day^{-1}). This rate yields a half-life of 34.5 years.

If the dissolved benzene leaching rate is graphed, it yields a first-order decay rate of 0.000372 day^{-1}, which is equivalent to a half-life of 5.6 years. Adding the average physical flushing rate (0.000372 day^{-1}) to the estimated biodegradation rate (0.000055 day^{-1}) yields a combined benzene source weathering rate of 0.000427 day^{-1}, which is equivalent to a half-life of 4.4 years.

Therefore, the source half-life for use in the Bioscreen model is 4.4 years.

TABLE XX
BATCH FLUSHING MODEL RESULTS
RISK-BASED APPROACH TO REMEDIATION
FORMER MILITARY GAS STATION
EAKER AFB, ARKANSAS

Aquitard Pore-Water Replacement Rate = 22.3 years Assume Starting Soil Benzene Concentration of 0.612 mg/kg[a/] K_{oc}[b/] for benzene = 79 L/kg[c/] and K_d[d/] = 0.113 L/kg			
Pore Volume	Years	**Scenario 1** **Flushing Only - No Biodegradation** Benzene Concentration in Groundwater (mg/L)[f/]	**Scenario 2** **Flushing plus Biodegradation**[e/] Benzene Concentration in Groundwater (mg/L)
0.00	0	5.4	5.4
0.04	1	4.7	4.6
0.09	2	4.1	4.0
0.13	3	3.6	3.4
0.18	4	3.1	2.9
0.22	5	2.7	2.5
0.27	6	2.4	2.1
0.31	7	2.1	1.8
0.36	8	1.8	1.6
0.40	9	1.6	1.3
0.45	10	1.4	1.1
0.49	11	1.2	0.98
0.54	12	1.1	0.83
0.58	13	0.93	0.71
0.63	14	0.81	0.61
0.67	15	0.71	0.52
0.72	16	0.62	0.45
0.76	17	0.54	0.38
0.81	18	0.47	0.33
0.85	19	0.41	0.28
0.90	20	0.36	0.24
0.94	21	0.31	0.21
0.99	22	0.27	0.18
1.03	23	0.24	0.15
1.08	24	0.21	0.13
1.12	25	0.18	0.11
1.17	26	0.16	**0.094**
1.21	27	0.14	0.081
1.26	28	0.12	0.069
1.30	29	0.11	0.059
1.35	30	**0.092**	0.050
1.39	31	0.080	0.043
1.43	32	0.070	0.037
1.48	33	0.061	0.032
1.52	34	0.053	0.027
1.57	35	0.047	0.023
1.61	36	0.041	0.020
1.66	37	0.036	0.017
1.70	38	0.031	0.015
1.75	39	0.027	0.012
1.79	40	0.024	0.011
1.84	41	0.021	**0.0091**
1.88	42	0.018	
1.93	43	0.016	
1.97	44	0.014	
2.02	45	0.012	
2.06	46	0.010	
2.11	47	**0.0092**	

[a/] mg/kg = Milligrams per kilogram.

[b/] K_{oc} = Soil adsorption coefficient for soil organic content.

[c/] L/kg = Liters per kilogram.

[d/] K_d = Calculated site-specific benzene distribution coefficient (soil to water).

[e/] Incorporates average flushing half-life (5.1 years) and assumed biodegradation half-life (34.5 years) to yield an overall half-life of 4.4 years.

[f/] mg/L = Milligrams per liter.

BIOSCREEN Natural Attenuation Decision Support System

Air Force Center for Environmental Excellence — *Version 1.4*

Eaker
Former Mil. Gas Stat.
Run Name

Data Input Instructions:

115 or 0.02 — *1. Enter value directly... or 2. Calculate by filling in grey cells below. (To restore formulas, hit button below).*

Variable* — *Data used directly in model.*

20 — *Value calculated by model. (Don't enter any data).*

1. HYDROGEOLOGY

Seepage Velocity*	Vs	55.2	(ft/yr)
or		↑ or	
Hydraulic Conductivity	K	1.9E-02	(cm/sec)
Hydraulic Gradient	I	0.00077	(ft/ft)
Porosity	n	0.28	(-)

2. DISPERSION

Longitudinal Dispersivity*	alpha x	55.0	(ft)
Transverse Dispersivity*	alpha y	0.81	(ft)
Vertical Dispersivity*	alpha z	0	(ft)
or		↑ or	
Estimated Plume Length	Lp	700	(ft)

3. ADSORPTION

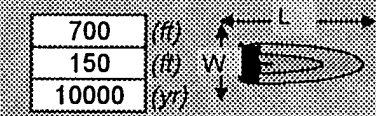
Retardation Factor*	R	1.71	(-)
or		↑ or	
Soil Bulk Density	rho	1.69	(kg/l)
Partition Coefficient	Koc	79	(L/kg)
FractionOrganicCarbon	foc	2.3E-3	(-)

4. BIODEGRADATION

1st Order Decay Coeff*	lambda	6.7E-1	(per yr)
or		↑ or	
Solute Half-Life	t-half	1.04	(year)
or Instantaneous Reaction Model			
Delta Oxygen*	DO	0	(mg/L)
Delta Nitrate*	NO3	0.03675	(mg/L)
Observed Ferrous Iron*	Fe2+	10.2753	(mg/L)
Delta Sulfate*	SO4	23.618	(mg/L)
Observed Methane*	CH4	3.283	(mg/L)

5. GENERAL

Modeled Area Length*	700	(ft)
Modeled Area Width*	150	(ft)
Simulation Time*	10000	(yr)



6. SOURCE DATA

Source Thickness in Sat.Zone* 0.5 (ft)

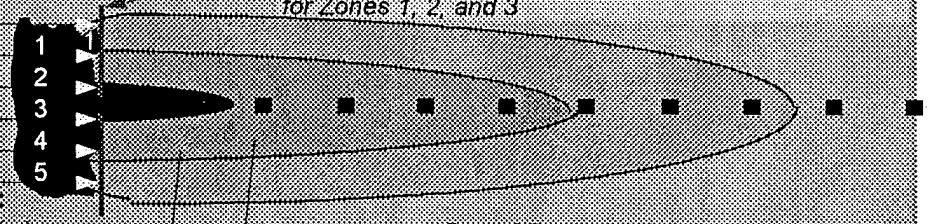
Source Zones:

Width* (ft)	Conc. (mg/L)*
5	0.005
15	0.5
32	6.4
15	0.5
5	0.005

Source Halflife (see Help):

Infinite	Infinite	(yr)
Inst. React.	↑ 1st Order	
Soluble Mass In Source NAPL, Soil	infinite	(Kg)

Vertical Plane Source. Look at Plume Cross-Section and Input Concentrations & Widths for Zones 1, 2, and 3



View of Plume Looking Down

Observed Centerline Concentrations at Monitoring Wells If No Data Leave Blank or Enter "0"

7. FIELD DATA FOR COMPARISON

Dist. from Source (ft)	Concentration (mg/L)
0	6.4
70	
102	2.5
231	.66
280	
350	
423	.003
490	
560	
651	.00073
700	

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE — **View Output**

RUN ARRAY — **View Output**

Help

Recalculate This Sheet

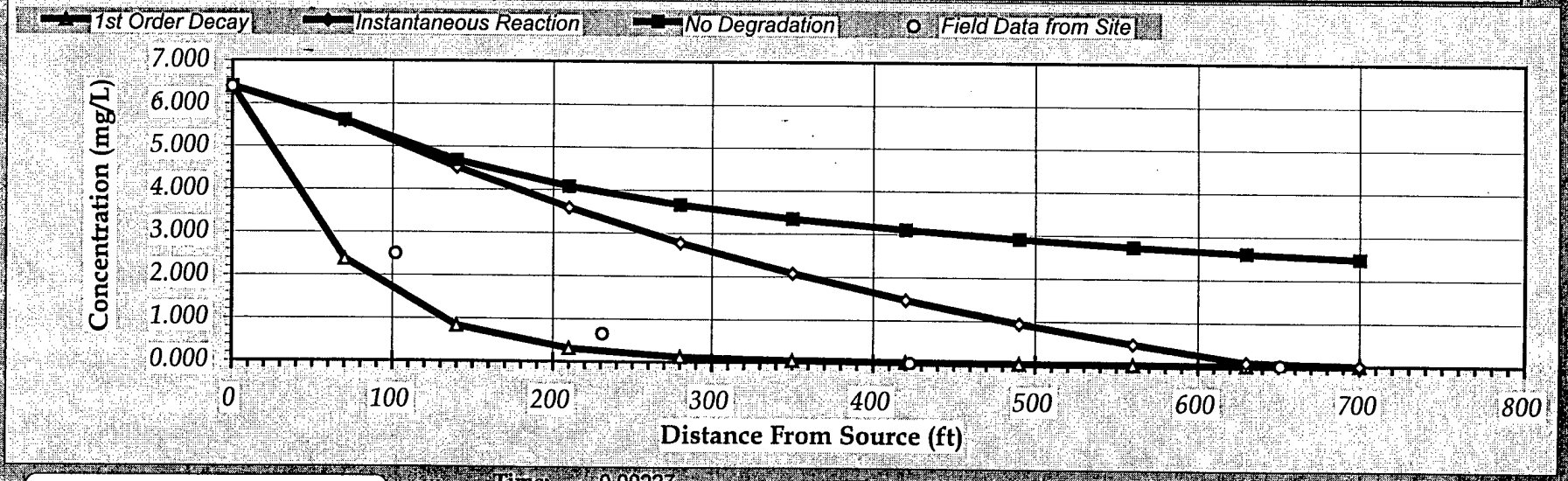
Paste Example Dataset

Restore Formulas for Vs, Dispersivities, R, lambda, other

Original, Pre-Remediation Conditions

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

TYPE OF MODEL	Distance from Source (ft) 0	70	140	210	280	350	420	490	560	630	700
No Degradation	6.400	5.614	4.681	4.078	3.658	3.344	3.099	2.901	2.737	2.597	2.477
1st Order Decay	6.400	2.372	0.835	0.307	0.117	0.045	0.018	0.007	0.003	0.001	0.000
Inst. Reaction	6.400	5.607	4.517	3.583	2.774	2.076	1.472	0.946	0.483	0.074	0.000
Field Data from Site	6.400		2.500	0.660			0.003			0.00073	



Time: 0.00227

10,000 Years

Calculate Animation

Return to Input

Recalculate This Sheet

BIOSCREEN Natural Attenuation Decision Support System

Air Force Center for Environmental Excellence — *Version 1.4*

Run Name: Eaker / Former Mil. Gas Stat.

Data Input Instructions:
1. Enter value directly ...or
2. Calculate by filling in grey cells below. (To restore formulas, hit button below).

Variable* — Data used directly in model
20 — Value calculated by model. (Don't enter any data).

1. HYDROGEOLOGY

Seepage Velocity*	Vs	55.2	(ft/yr)
or		↑ or	
Hydraulic Conductivity	K	1.9E-02	(cm/sec)
Hydraulic Gradient	I	0.00077	(ft/ft)
Porosity	n	0.28	(-)

2. DISPERSION

Longitudinal Dispersivity*	alpha x	55.0	(ft)
Transverse Dispersivity*	alpha y	0.81	(ft)
Vertical Dispersivity*	alpha z	0	(ft)
or		↑ or	
Estimated Plume Length	Lp	700	(ft)

3. ADSORPTION

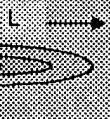
Retardation Factor*	R	1.71	(-)
or		↑ or	
Soil Bulk Density	rho	1.59	(kg/l)
Partition Coefficient	Koc	79	(L/kg)
FractionOrganicCarbon	foc	2.3E-3	(-)

4. BIODEGRADATION

1st Order Decay Coeff*	lambda	6.7E-1	(per yr)
or		↑ or	
Solute Half-Life	t-half	1.04	(year)
or Instantaneous Reaction Model			
Delta Oxygen*	DO	0	(mg/L)
Delta Nitrate*	NO3	0.03675	(mg/L)
Observed Ferrous Iron*	Fe2+	10.2753	(mg/L)
Delta Sulfate*	SO4	23.618	(mg/L)
Observed Methane*	CH4	3.283	(mg/L)

5. GENERAL

Modeled Area Length*	700	(ft)
Modeled Area Width*	150	(ft)
Simulation Time*	10000	(yr)



6. SOURCE DATA

Source Thickness in Sat.Zone* 0.5 (ft)

Source Zones:

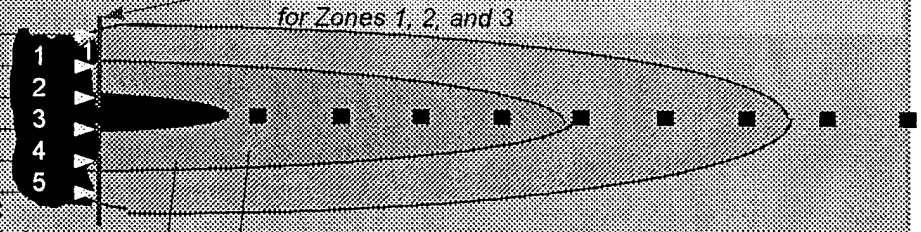
Width* (ft)	Conc. (mg/L)*
5	0.0023125
15	0.23125
32	2.96
15	0.23125
5	0.0023125

Source Halflife (see Help):

Infinite	Infinite	(yr)
Inst. React. N	↑ 1st Order	
Soluble Mass	infinite	(Kg)

In Source NAPL, Soil

Vertical Plane Source: Look at Plume Cross-Section and Input Concentrations & Widths for Zones 1, 2, and 3



View of Plume Looking Down

Observed Centerline Concentrations at Monitoring Wells If No Data Leave Blank or Enter "0"

7. FIELD DATA FOR COMPARISON

Dist. from Source (ft)	Concentration (mg/L)
0	6.4
70	
102	2.5
231	.66
280	
350	
423	.003
490	
560	
651	.00073
700	

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE — View Output

RUN ARRAY — View Output

Help

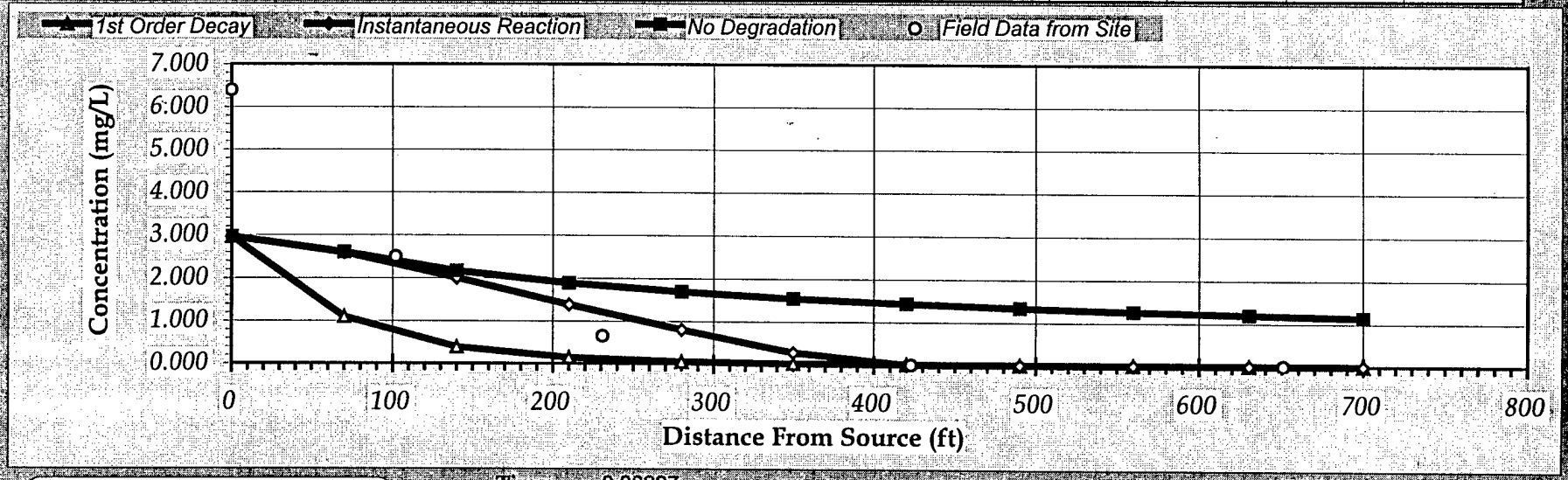
Recalculate This Sheet

Paste Example Dataset

Restore Formulas for Vs, Dispersivities, R, lambda, other

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

TYPE OF MODEL	Distance from Source (ft) 0	70	140	210	280	350	420	490	560	630	1000 700
No Degradation	2.960	2.596	2.165	1.886	1.692	1.547	1.433	1.342	1.266	1.201	1.146
1st Order Decay	2.960	1.0969	0.386	0.142	0.054	0.021	0.008	0.003	0.001	0.001	0.000
Inst. Reaction	2.960	2.5893	2.001	1.391	0.808	0.278	0.000	0.000	0.000	0.000	0.000
Field Data from Site	6.400		2.500	0.660			0.003			0.00073	



Time: 0.00227

10,000 Years

Calculate Animation

Return to Input

Recalculate This Sheet

BIOSCREEN Natural Attenuation Decision Support System

Air Force Center for Environmental Excellence

Version 1.4

Eaker
Former Mil. Gas Stat.
Run Name

Data Input Instructions:

115 — 1. Enter value directly... or
or
0.02 — 2. Calculate by filling in grey cells below. (To restore formulas, hit button below).

Variable* — Data used directly in model.
20 — Value calculated by model. (Don't enter any data).

1. HYDROGEOLOGY

Seepage Velocity*	Vs	55.2	(ft/yr)
or		or	
Hydraulic Conductivity	K	1.9E-02	(cm/sec)
Hydraulic Gradient	I	0.00077	(ft/ft)
Porosity	n	0.28	(-)

2. DISPERSION

Longitudinal Dispersivity*	alpha x	55.0	(ft)
Transverse Dispersivity*	alpha y	0.81	(ft)
Vertical Dispersivity*	alpha z	0	(ft)
or		or	
Estimated Plume Length	Lp	700	(ft)

3. ADSORPTION

Retardation Factor*	R	1.71	(-)
or		or	
Soil Bulk Density	rho	1.59	(kg/l)
Partition Coefficient	Koc	79	(L/kg)
FractionOrganicCarbon	foc	2.3E-3	(-)

4. BIODEGRADATION

1st Order Decay Coeff*	lambda	6.7E-1	(per yr)
or		or	
Solute Half-Life	t-half	1.04	(year)
or Instantaneous Reaction Model			
Delta Oxygen*	DO	0	(mg/L)
Delta Nitrate*	NO3	0.03675	(mg/L)
Observed Ferrous Iron*	Fe2+	10.2753	(mg/L)
Delta Sulfate*	SO4	23.618	(mg/L)
Observed Methane*	CH4	3.283	(mg/L)

5. GENERAL

Modeled Area Length*	700	(ft)
Modeled Area Width*	150	(ft)
Simulation Time*	10000	(yr)



6. SOURCE DATA

Source Thickness in Sat.Zone* 0.5 (ft)

Source Zones:

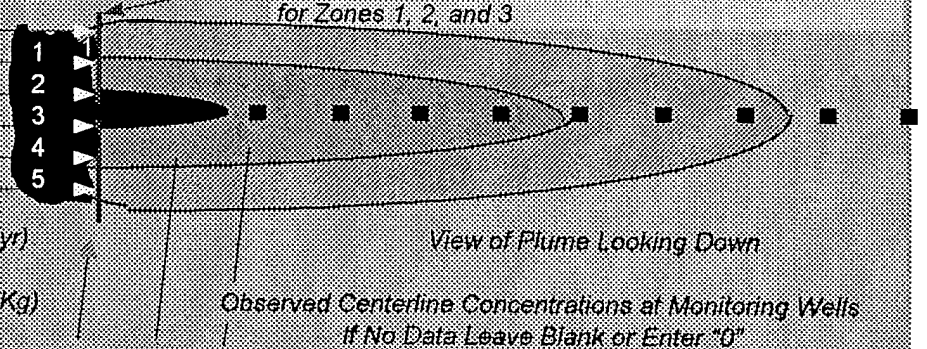
Width* (ft)	Conc. (mg/L)*
5	0.00101563
15	0.1015625
32	1.3
15	0.1015625
5	0.00101563

Source Halflife (see Help):

Infinite	Infinite (yr)
Inst. React.	1st Order
Soluble Mass	infinite (Kg)

In Source NAPL Soil

Vertical Plane Source: Look at Plume Cross-Section and Input Concentrations & Widths for Zones 1, 2, and 3



View of Plume Looking Down

Observed Centerline Concentrations at Monitoring Wells If No Data Leave Blank or Enter "0"

7. FIELD DATA FOR COMPARISON

Concentration (mg/L)	6.4		2.5	.66			.003			.00073	
Dist. from Source (ft)	0	70	102	231	280	350	423	490	560	651	700

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE — **View Output**

RUN ARRAY — **View Output**

Help

Recalculate This Sheet

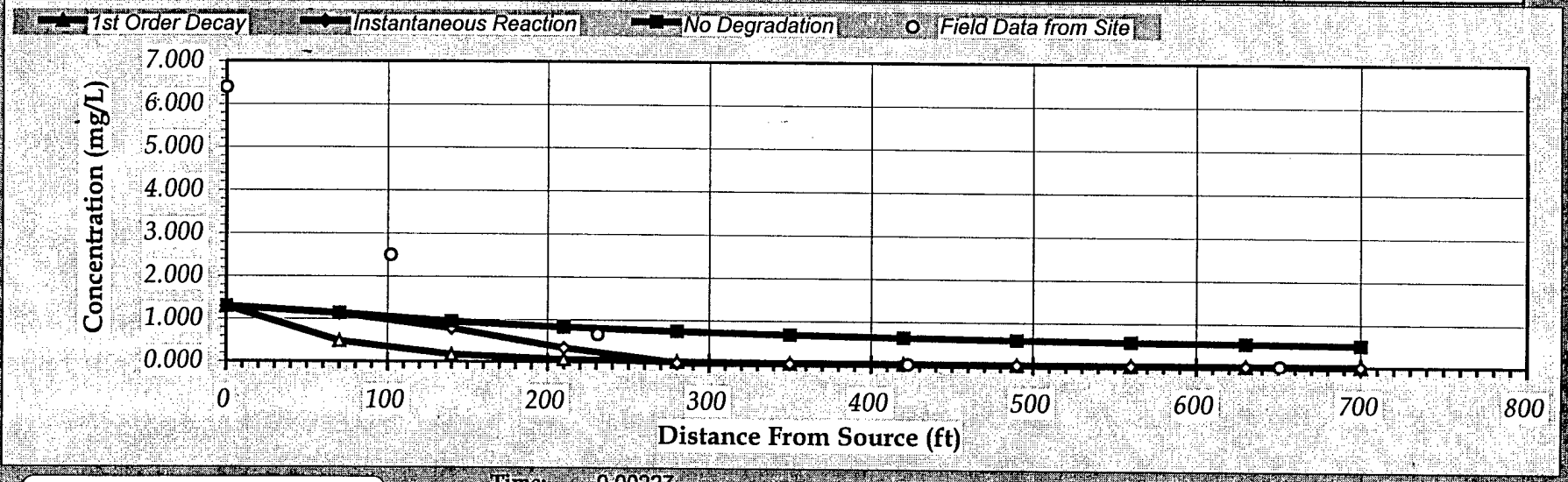
Paste Example Dataset

Restore Formulas for Vs, Dispersivities, R, lambda, other

YEAR 10

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

TYPE OF MODEL	Distance from Source (ft) 0	70	140	210	280	350	420	490	560	630	1000 700
No Degradation	1.300	1.140	0.951	0.828	0.743	0.679	0.630	0.589	0.556	0.528	0.503
1st Order Decay	1.300	0.4817	0.170	0.062	0.024	0.009	0.004	0.001	0.001	0.000	0.000
Inst. Reaction	1.300	1.1333	0.787	0.333	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Field Data from Site	6.400		2.500	0.660			0.003			0.00073	



Time: 0.00227

10,000 Years

Calculate Animation

Return to Input

Recalculate This Sheet

BIOSCREEN Natural Attenuation Decision Support System

Air Force Center for Environmental Excellence — *Version 1.4*

Eaker
Former Mil. Gas Stat.
Run Name

Data Input Instructions:

115 — *1. Enter value directly, ...or*
or — *2. Calculate by filling in grey*
0.02 — *cells below. (To restore formulas, hit button below)*

Variable* — *Data used directly in model.*
20 — *Value calculated by model. (Don't enter any data).*

1. HYDROGEOLOGY

Seepage Velocity*	Vs	55.2	(ft/yr)
or		or	
Hydraulic Conductivity	K	1.9E-02	(cm/sec)
Hydraulic Gradient	I	0.00077	(ft/ft)
Porosity	n	0.28	(-)

2. DISPERSION

Longitudinal Dispersivity*	alpha x	55.0	(ft)
Transverse Dispersivity*	alpha y	0.81	(ft)
Vertical Dispersivity*	alpha z	0	(ft)
or		or	
Estimated Plume Length	Lp	700	(ft)

3. ADSORPTION

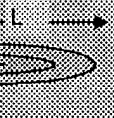
Retardation Factor*	R	1.71	(-)
or		or	
Soil Bulk Density	rho	1.59	(kg/l)
Partition Coefficient	Koc	79	(L/kg)
FractionOrganicCarbon	foc	2.3E-3	(-)

4. BIODEGRADATION

1st Order Decay Coeff*	lambda	6.7E-1	(per yr)
or		or	
Solute Half-Life	t-half	1.04	(year)
or Instantaneous Reaction Model			
Delta Oxygen*	DO	0	(mg/L)
Delta Nitrate*	NO3	0.03675	(mg/L)
Observed Ferrous Iron*	Fe2+	10.2753	(mg/L)
Delta Sulfate*	SO4	23.618	(mg/L)
Observed Methane*	CH4	3.283	(mg/L)

5. GENERAL

Modeled Area Length*	700	(ft)
Modeled Area Width*	150	(ft)
Simulation Time*	10000	(yr)



6. SOURCE DATA

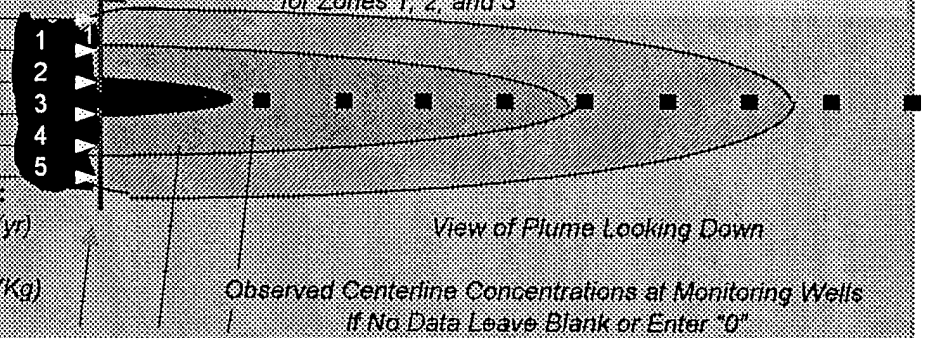
Source Thickness in Sat.Zone* 0.5 (ft)

Source Zones:

	Width* (ft)	Conc. (mg/L)*
1	5	0.00022188
2	15	0.0221875
3	32	0.284
4	15	0.0221875
5	5	0.00022188

Source Halflife (see Help): Infinite | Infinite (yr)
Inst. React | 1st Order
Soluble Mass: infinite (Kg)
In Source NAPL, Soil

Vertical Plane Source: Look at Plume Cross-Section and Input Concentrations & Widths for Zones 1, 2, and 3



View of Plume Looking Down

Observed Centerline Concentrations at Monitoring Wells
If No Data Leave Blank or Enter "0"

7. FIELD DATA FOR COMPARISON

Concentration (mg/L)	6.4		2.5	.66			.003			.00073	
Dist. from Source (ft)	0	70	102	231	280	350	423	490	560	651	700

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE — **View Output**

RUN ARRAY — **View Output**

Help

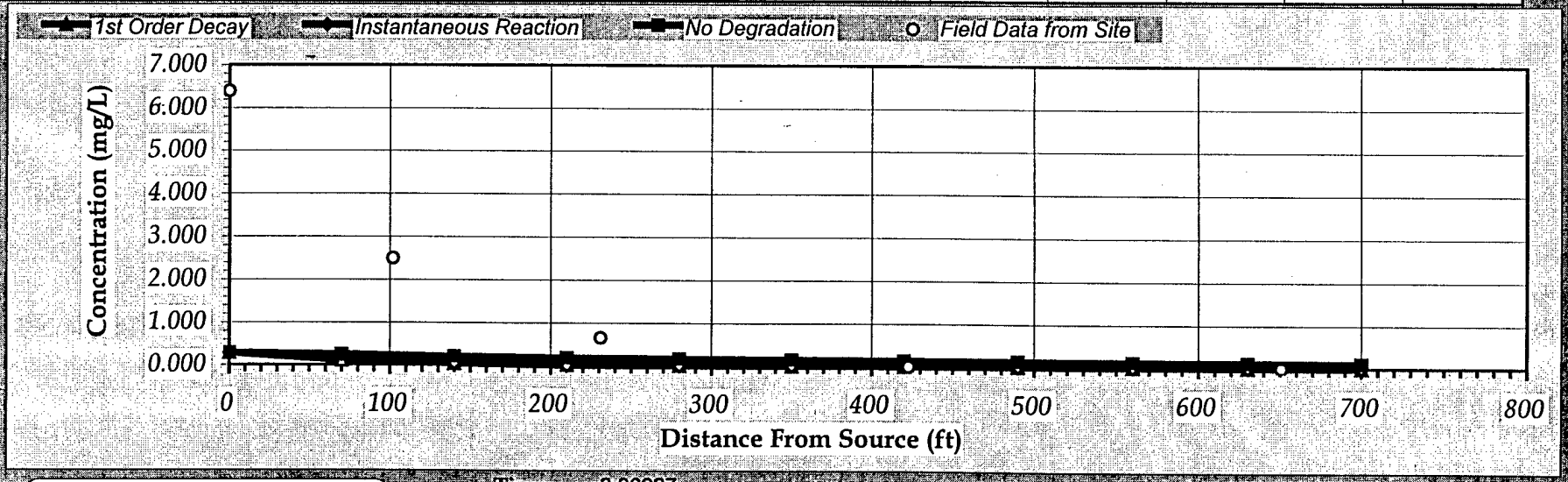
Recalculate This Sheet

Paste Example Dataset

Restore Formulas for Vs, Dispersivities, R, lambda, other

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

TYPE OF MODEL	Distance from Source (ft) 0	70	140	210	280	350	420	490	560	630	1000 700
No Degradation	0.284	0.249	0.208	0.181	0.162	0.148	0.138	0.129	0.121	0.115	0.110
1st Order Decay	0.284	0.1052	0.037	0.014	0.005	0.002	0.001	0.000	0.000	0.000	0.000
Inst. Reaction	0.284	0.2421	0.044	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Field Data from Site	6.400		2.500	0.660			0.003			0.00073	



Time: 0.00227

10,000 Years

Calculate Animation

Return to Input

Recalculate This Sheet

BIOSCREEN Natural Attenuation Decision Support System

Air Force Center for Environmental Excellence — *Version 1.4*

Eaker
Former Mil. Gas Stat.
Run Name

Data Input Instructions:

115 or 0.02 — 1. Enter value directly ...or 2. Calculate by filling in grey cells below. (To restore formulas, hit button below)

Variable* — Data used directly in model.

20 — Value calculated by model. (Don't enter any data).

1. HYDROGEOLOGY

Seepage Velocity*	Vs	55.2	(ft/yr)
or		↑ or	
Hydraulic Conductivity	K	1.9E-02	(cm/sec)
Hydraulic Gradient	I	0.00077	(ft/ft)
Porosity	n	0.28	(-)

2. DISPERSION

Longitudinal Dispersivity*	alpha x	55.0	(ft)
Transverse Dispersivity*	alpha y	0.81	(ft)
Vertical Dispersivity*	alpha z	0	(ft)
or		↑ or	
Estimated Plume Length	Lp	700	(ft)

3. ADSORPTION

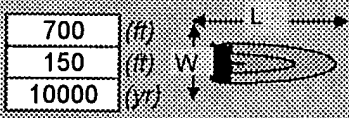
Retardation Factor*	R	1.71	(-)
or		↑ or	
Soil Bulk Density	rho	1.59	(kg/l)
Partition Coefficient	Koc	79	(L/kg)
FractionOrganicCarbon	foc	2.3E-3	(-)

4. BIODEGRADATION

1st Order Decay Coeff*	lambda	6.7E-1	(per yr)
or		↑ or	
Solute Half Life	t-half	1.04	(year)
or Instantaneous Reaction Model			
Delta Oxygen*	DO	0	(mg/L)
Delta Nitrate*	NO3	0.03675	(mg/L)
Observed Ferrous Iron*	Fe2+	10.2753	(mg/L)
Delta Sulfate*	SO4	23.618	(mg/L)
Observed Methane*	CH4	3.283	(mg/L)

5. GENERAL

Modeled Area Length*	700	(ft)
Modeled Area Width*	150	(ft)
Simulation Time*	10000	(yr)



6. SOURCE DATA

Source Thickness in Sat.Zone* 0.5 (ft)

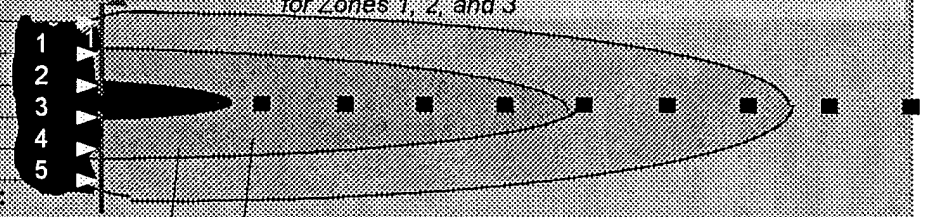
Source Zones:

Width* (ft)	Conc. (mg/L)*
5	4.6328E-05
15	0.00463281
32	0.0593
15	0.00463281
5	4.6328E-05

Source Halflife (see Help):

Infinite	Infinite	(yr)
Inst. React	↑ 1st Order	
Soluble Mass In Source NAPL, Soil	infinite	(Kg)

Vertical Plane Source: Look at Plume Cross-Section and Input Concentrations & Widths for Zones 1, 2, and 3



View of Plume Looking Down

Observed Centerline Concentrations at Monitoring Wells If No Data Leave Blank or Enter "0"

7. FIELD DATA FOR COMPARISON

Concentration (mg/L)	6.4		2.5	.66			.003			.00073	
Dist. from Source (ft)	0	70	102	231	280	350	423	490	560	651	700

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE — **View Output**

RUN ARRAY — **View Output**

Help

Recalculate This Sheet

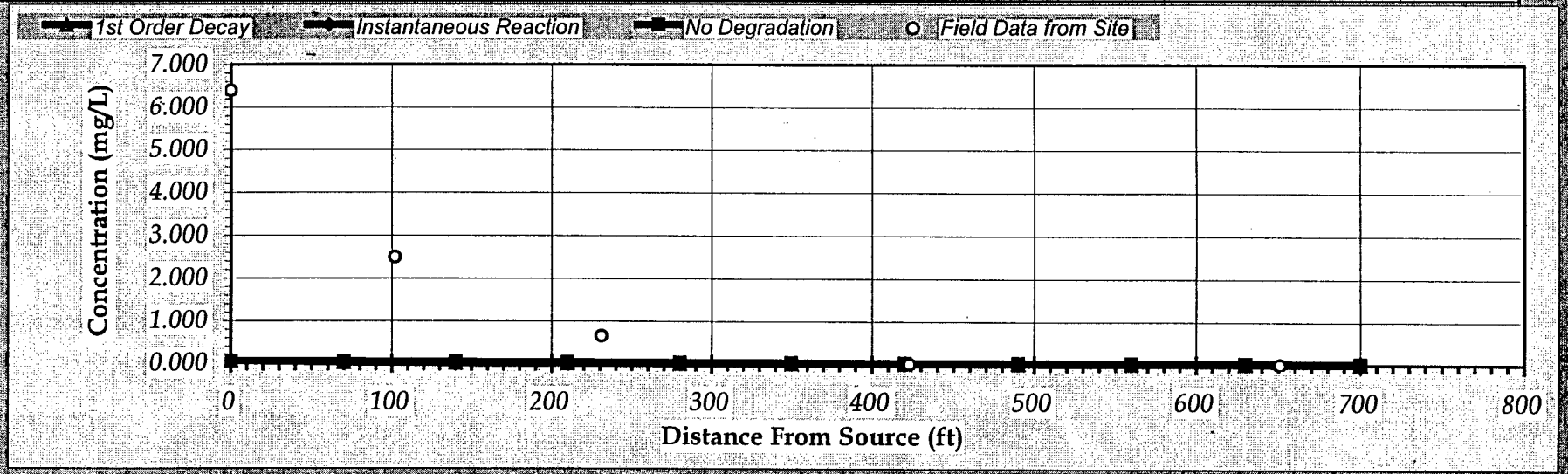
Paste Example Dataset

Restore Formulas for Vs, Dispersivities, R, lambda, other

YEAR 30

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

TYPE OF MODEL	Distance from Source (ft) 0	70	140	210	280	350	420	490	560	630	1000 700
No Degradation	0.059	0.052	0.043	0.038	0.034	0.031	0.029	0.027	0.025	0.024	0.023
1st Order Decay	0.059	0.0220	0.008	0.003	0.001	0.000	0.000	0.000	0.000	0.000	0.000
Inst. Reaction	0.059	0.0450	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Field Data from Site	6.400		2.500	0.660			0.003			0.00073	



Time: 0.00227

10,000 Years

Calculate Animation

Return to Input

Recalculate This Sheet

BIOSCREEN Natural Attenuation Decision Support System

Air Force Center for Environmental Excellence

Version 1.4

Eaker
Former Mil. Gas Stat.
Run Name

Data Input Instructions:

115 — 1. Enter value directly, ...or
or — 2. Calculate by filling in grey
0.02 — cells below. (To restore
formulas, hit button below).

Variable* — Data used directly in model.
20 — Value calculated by model.
(Don't enter any data).

1. HYDROGEOLOGY

Seepage Velocity*	Vs	55.2	(ft/yr)
or		↑ or	
Hydraulic Conductivity	K	1.9E-02	(cm/sec)
Hydraulic Gradient	I	0.00077	(ft/ft)
Porosity	n	0.28	(-)

2. DISPERSION

Longitudinal Dispersivity*	alpha x	55.0	(ft)
Transverse Dispersivity*	alpha y	0.81	(ft)
Vertical Dispersivity*	alpha z	0	(ft)
or		↑ or	
Estimated Plume Length	Lp	700	(ft)

3. ADSORPTION

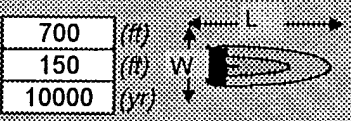
Retardation Factor*	R	1.71	(-)
or		↑ or	
Soil Bulk Density	rho	1.59	(kg/l)
Partition Coefficient	Koc	79	(L/kg)
FractionOrganicCarbon	foc	2.3E-3	(-)

4. BIODEGRADATION

1st Order Decay Coeff*	lambda	6.7E-1	(per yr)
or		↑ or	
Solute Half-Life	t-half	1.04	(year)
or Instantaneous Reaction Model			
Delta Oxygen*	DO	0	(mg/L)
Delta Nitrate*	NO3	0.03675	(mg/L)
Observed Ferrous Iron*	Fe2+	10.2753	(mg/L)
Delta Sulfate*	SO4	23.618	(mg/L)
Observed Methane*	CH4	3.283	(mg/L)

5. GENERAL

Modeled Area Length*	700	(ft)
Modeled Area Width*	150	(ft)
Simulation Time*	10000	(yr)



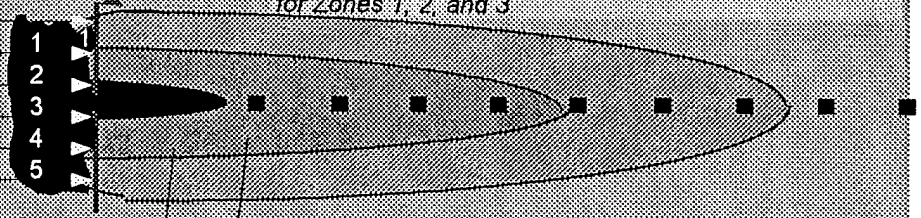
6. SOURCE DATA

Source Thickness in Sat.Zone* 0.5 (ft)

Source Zones:

Width* (ft)	Conc. (mg/L)*
5	8.4375E-06
15	0.00084375
32	0.0108
15	0.00084375
5	8.4375E-06

Vertical Plane Source: Look at Plume Cross-Section and Input Concentrations & Widths for Zones 1, 2, and 3



Source Halflife (see Help):

Infinite	Infinite	(yr)
Inst. React. N	↑ 1st Order	
Soluble Mass	infinite	(Kg)
In Source NAPL Soil		

View of Plume Looking Down

Observed Centerline Concentrations at Monitoring Wells
If No Data Leave Blank or Enter "0"

7. FIELD DATA FOR COMPARISON

Concentration (mg/L)	6.4		2.5	.66			.003			.00073	
Dist. from Source (ft)	0	70	102	231	280	350	423	490	560	651	700

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE — **View Output**

RUN ARRAY — **View Output**

Help

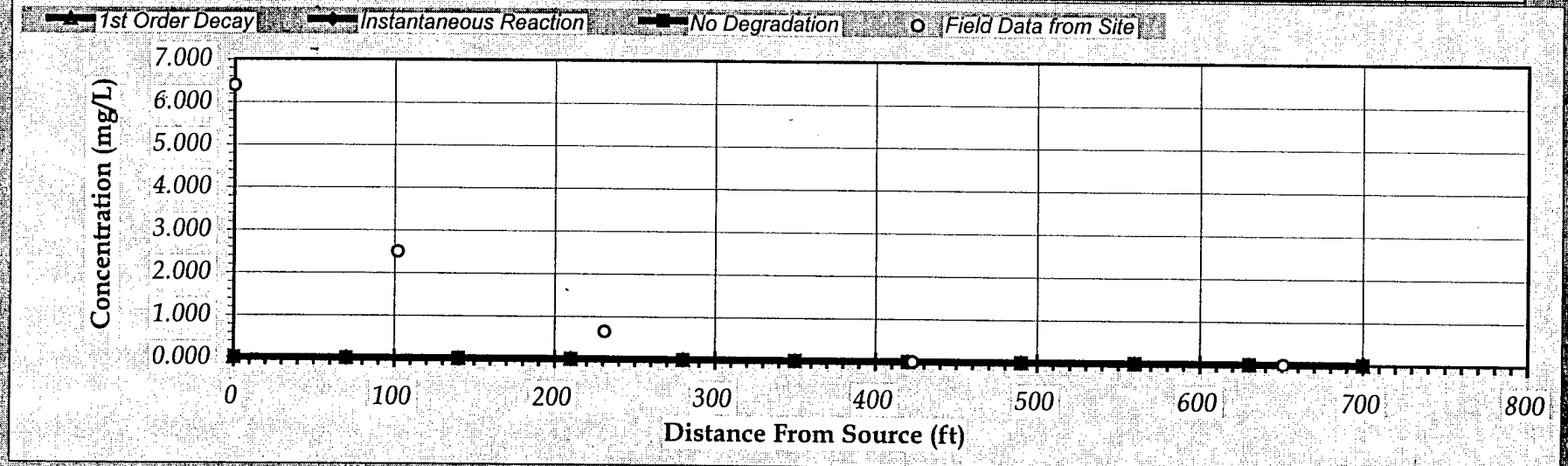
Recalculate This Sheet

Paste Example Dataset

Restore Formulas for Vs, Dispersivities, R, lambda, other

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

TYPE OF MODEL	Distance from Source (ft) 0	70	140	210	280	350	420	490	560	630	1000 700
No Degradation	0.011	0.009	0.008	0.007	0.006	0.006	0.005	0.005	0.005	0.004	0.004
1st Order Decay	0.011	0.0040	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Inst. Reaction	0.011	0.0024	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Field Data from Site	6.400		2.500	0.660			0.003			0.00073	



Time: 0.00227

10,000 Years

Calculate Animation

Return to Input

Recalculate This Sheet